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CALCULATION OF THE GLASS TRANSITION TEMPERATURES OF LINEAR POLYMERS PART 3 EVALUATION OF CALCULATION RELATIONSHIPS

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CALCULATION OF THE GLASS TRANSITION TEMPERATURES OF LINEAR POLYMERS
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SUMMARY

Four equations, relating the structure of polymers in numerical form to their glass transition temperatures (Tg)s, are evaluated using a large data set of 1179 polymers. Additive temperature parameters, for the relationship giving the best fit to the data, are tabulated which enable predictions to be made of many polymer Tgs outside the data set. These parameters also provide a measure of the relative effectiveness of groups in internally plasticising polymers.

Departmental Reference: Materials and Structures 233

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1 INTRODUCTION

This is Part 3 of a series of Reports on the calculation of the glass transition temperatures (Tgs) of linear polymers. An earlier Technical Memorandum emphasised the importance and significance of the Tg[1], Part 1 of this series described how a large data set of polymers could be ordered unambiguously[2], and Part 2 described the data set itself[3].

Since the glass transition temperature (Tg) of polymers was first observed, workers have attempted to relate polymer chemical structures to their Tgs and interest in the subject is reflected in the fact that there have been over 100 papers on the calculation of Tgs since 1965. Unfortunately, the polymer data sets to which the relationships have been applied have been insufficiently large, in most cases, to provide an adequate test of their validity; the data chosen could have provided, adventitiously a better fit to the relationships than might be found with a different, or larger, polymer data set. The significance of the size of, and distribution of polymers and groups within, the present data set of 1179 polymers has been discussed[3].

In the present Report, the results of applying four relationships to the 1179 polymer data set are described. Additive temperature parameters (ATPs) are calculated which may be used in the prediction of polymer Tgs; these parameters also provide a measure of the relative effectiveness of groups in internally plasticising polymers. This Report goes on to provide analytical data on the results in the form of tables which facilitate updating of the data set by correlating calculation errors with specific polymers and groups. However, this aspect is not pursued in discussion as the main object of this Report is to provide the already-mentioned ATPs.

2 RELATIONSHIPS EVALUATED

Some of the relationships evaluated have been used before on a small data set of polymers having alkyl side chains[4]. A much larger set of such polymers are included in the present data set. The previous analysis did not use the Bayesian statistics of the present calculation and therefore did not provide ATPs for each chemical group as does the treatment described here[5,6]. There are other distinctions. The relationships tested in the present analysis are:

$$Tg = \sum_{\ell=1}^{\ell=x} (n_i Tg_i) \qquad (1)$$

$$\frac{1}{Tg} = \sum_{\ell=1}^{\ell=x} \left(\frac{w_i}{Tg_i}\right) , \qquad (2)$$

$$\frac{1}{Tg} = \sum_{i=1}^{i=x} \left(\frac{n_i}{Tg_i}\right) , \qquad (3)$$

and

$$\ell nTg = \sum_{i=1}^{i=x} (n_i \ell nTg_i) , \qquad (4)$$

where Tg = glass transition temperature of the polymer,

Tg_i = the additive temperature parameter (ATP) of the ith group,

n_i = mole fraction of the ith group,

w_i = weight fraction of the ith group

and x = the number of groups in the polymer.

In this treatment, a 'group' is considered to be the smallest polymer segment capable of independent torsional oscillation with respect to its nearest neighbours and is otherwise as previously defined[3]. Each group is identified by an arbitrary code number and the nearest neighbours are considered to be invariant. Dependant as the Tg is on the barriers to rotation between groups and their nearest neighbours, this condition is considered to be an essential aspect of the present treatment. Equation (1) has been successfully applied previously[7,8] to smaller data sets in a different type of statistical analysis. This equation would be the same as the simplified form of the DiMarzio and Gibbs relationship[9] if n_i represented the fraction of rotatable (flexible) bonds in the ith group and Tg_i were equal to, or a constant fraction of, the T_2 value of a homopolymer of the ith group; T_2 is the temperature below which such a polymer possesses zero configurational entropy. However, the application of the equation here is purely empirical and embodies the assumption that the Tg of a polymer is a linear function of the Tg contributions of its constituent groups in proportion to their mole fractions, with the important qualification, repeated for emphasis, that the neighbours of the single-groups are invariable[2,3].

The application of the first equation is illustrated with respect to the first polymer of Table 5 of Part 2 [3] whose structure, in numerical terms is reproduced below. * indicates the beginning of a new polymer data line, so "833 1" is a continuation line.

```
*  1   8   219   56   1   57   1   58   1   59   1   60   1   72   2
       833   1
```

The polymer, identified as number 1, contains eight groups, has a Tg of 219 K, has one each of groups type 56, 57, 58, 59, 60 and 833, and two groups of type 72.

Applying equation (1) we find:

$$219 = (56 + 57 + 58 + 59 + 60 + 72 + 72 + 833)/P \quad ,$$

where the group numbers, within parentheses, are here used to identify the parameter numbers of groups, (ATPs or Tg_is), not the parameter values. Thus, for example, 56 is a parameter number for group 56 which has a value whose units are in degrees K. The Tg is therefore seen to be equated to the average Tg_i (or ATP).

The statistical treatment of the equations is described elsewhere[5,6].

3 RESULTS

Each of the equations provided a set of ATPs for the groups in the data set. From these parameters the Tgs of all the polymers were calculated and Table 1 shows the rms of the difference between calculated and observed Tgs (rms) for the four equations.

Table 1

Equation	rms (K)
1	12.6
2	15.6
3	21.1
4	15.2

Evidently, the first equation provides the lowest rms error. The maximum error in calculated Tg (see below) is associated with the same polymer, polymer 1325, for all equations. This polymer has a side-chain of 10 carbon atoms next to a heterocyclic ring and the published Tg may have been accorded to disordering of the carbon chain and be a sub-transition, rather than Tg which is normally regarded as marking substantial rotational liberation in the main chain. However, data have not been excluded from the set unless it was more certain that either the structure of the polymer, or the Tg value were positively in doubt. If the errors in calculated Tg are compared with the polymer structures it will be found that in many instances the higher Tg errors are associated with polymers having long carbon-chain sequences. Table 2 (microfiche) provides details on the difference (DIFF) between observed and estimated Tgs for each polymer using the different equations. In the table, DIFF, FDIFF, HDIFF and LDIFF relate to equations (1) to (4), respectively.

As the lowest errors are associated with equation (1), and equations (1), (3) and (4) are much easier to apply than equation (2), which requires a group weight parameter, the remainder of this discussion of results is restricted to those deriving from the use of equation (1).

A major interest of the present work stems from the need to know the relative contributions of different groups to the Tgs of polymers. Table 3 therefore shows the ATPs associated with each group in numerical order of increasing ATP and Table 4 presents the same data, but in hierarchical order[2] of the main (or central) single-group and simultaneously in increasing numerical order of ATP in respect of groups having the same main single-group, but one, or more, different neighbours; main- (M) and side-chain groups (S) are differentiated. This differentiation applies to the central group only. Though it is not the purpose of this Report to do other than present the results in the tables, it will be noted that numerous comparisons may be made between structures and ATPs. In general, despite the empirical nature of the relationships, it is seen that those factors which hinder rotation of the main group with respect to the neighbouring groups, such as polar interaction, bulkiness, steric factors, etc, tend to raise the ATP, and conversely, as is well known for polymer Tgs.

A disturbing feature of the results, despite the low rms error, is the large error in calculated Tg (>20 K) associated with 121 out of 1179 polymers. An analysis is therefore presented showing which polymers are associated with particular calculated Tg errors, Table 5 (microfiche computer printout), and which groups are associated with particular calculated Tg errors, Table 6 (microfiche computer printout). In Table 6, the columns are from left to right: line number (line 1 is not represented), group number, average Tg error (TGE), maximum Tg error, and paired numbers representing polymer number and associated Tg error for however many polymers contained the particular group. Continuation lines are distinguished by having no entries in the second to the fourth columns.

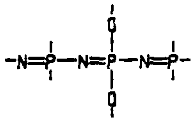
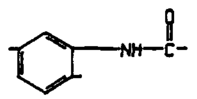
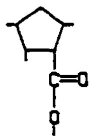
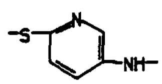
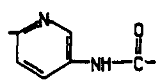
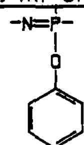
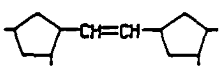
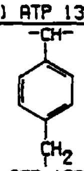
4 CONCLUSIONS

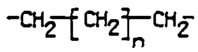
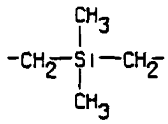
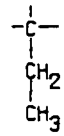
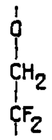
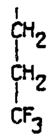
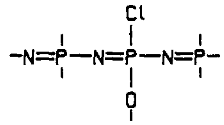
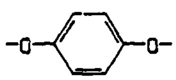
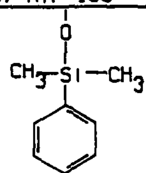
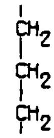
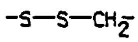
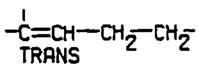
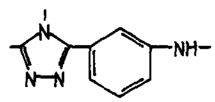
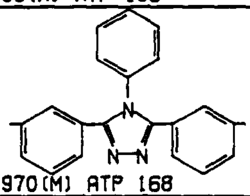
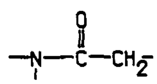
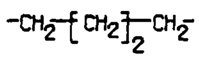
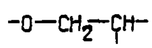
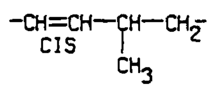
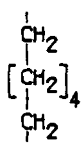
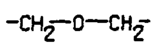
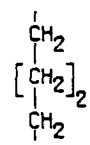
Of four equations, relating the structure of polymers in numerical form to their glass transition temperatures (Tg)s, the best fit, to a large data set of 1179 polymers, is provided by the equation relating the Tg to the mole fraction of groups in the polymers expressed in terms of group additive temperature parameters. An important proviso of the treatment is that the nearest neighbours of groups should be invariant.

Additive temperature parameters, for the relationship giving the best fit to the data, are tabulated which enable predictions to be made of many polymer Tgs outside the data set. These parameters also provide a measure of the relative effectiveness of groups in internally plasticising polymers.

Table 3

GROUPS IN NUMERICAL ORDER OF ATP

 162(M) ATP -72	$-Si-O-Si-$ 874(M) ATP -52	$-CH_2-NH-CH_2-$ 519(M) ATP 0	$-O-CF_2-CF_2-$ 773(S) ATP 44
 561(M) ATP 52	$-S-CH_2-CH_2-$ 741(S) ATP 54	$-C(=O)-O-CH-$ 1000(M) ATP 58	$-O-CH(-CH_2-)-CH_2-$ 572(M) ATP 67
 691(S) ATP 68	 1962(M) ATP 69	 1963(M) ATP 69	 625(S) ATP 70
$-CH-CH_2-O-$ 548(S) ATP 90	 1165(M) ATP 99	$-CH-S-CH_2-$ 546(M) ATP 115	$-Si-CH_2-CH_3$ 924(S) ATP 115
$-CF_2-CF_2-CF_2-$ 165(M) ATP 123	$-N=P-O-CH_2-$ 163(S) ATP 126	$-CH=CH-CH_2-CH_2-$ CIS 122(M) ATP 127	$-O-CH_2-CH_2-$ 59(S) ATP 129
$-CF_2-S-CF_2-$ 643(M) ATP 131	$-P(=O)-O-CH_2-$ 975(M) ATP 132	$-CH_2-CH_2-CH_2-$ 13(M) ATP 133	$-CH_2-CH(-CH_2-)-CH_2-$ 236(S) ATP 138
$-CH-CH_2-CH_2-$ 557(S) ATP 138	 68(S) ATP 139	$-C-O-CF_3$ 49(S) ATP 140	$-Sn-CH_2-CH_2-$ 814(S) ATP 147
$-CH=CH-CH_2-CH_2-$ TRANS 123(M) ATP 149	$-NH-Si(CH_3)_2-NH-$ 508(M) ATP 151	$-CH-C(=O)-O-$ 57(S) ATP 153	$-N=P-NH-CH_2-$ 818(S) ATP 153

 1321(M) ATP 155	 588(M) ATP 157	 841(S) ATP 158
 181(S) ATP 159	 421(S) ATP 159	 441(M) ATP 160
 673(M) ATP 162	 951(S) ATP 163	 60(S) ATP 164
 538(M) ATP 165	 849(M) ATP 166	 1969(M) ATP 168
 1970(M) ATP 168	 704(M) ATP 169	 770(M) ATP 169
 1302(M) ATP 169	 645(M) ATP 170	 372(M) ATP 171
 1354(S) ATP 172	 99(M) ATP 174	 1352(S) ATP 175

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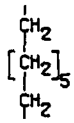
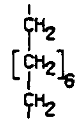
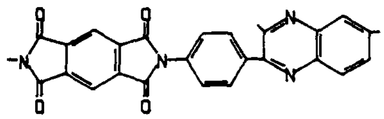
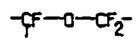
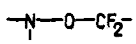
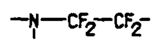
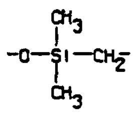
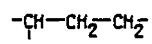
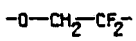
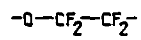
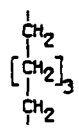
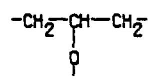
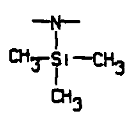
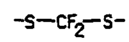
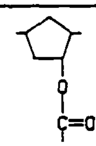
 1355(S) ATP 175	 1356(S) ATP 175
 2058(M) ATP 175	 433(M) ATP 177
 982(M) ATP 177	 1076(M) ATP 177
 297(M) ATP 181	 630(M) ATP 183
 797(M) ATP 183	 26(M) ATP 184
 1353(S) ATP 184	 459(M) ATP 185
 612(S) ATP 185	 751(M) ATP 185
 471(S) ATP 189	 726(S) ATP 191

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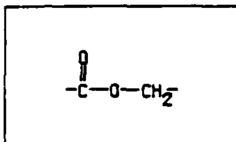
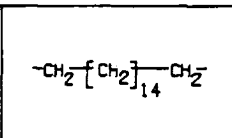
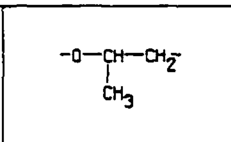
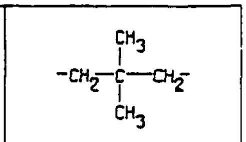
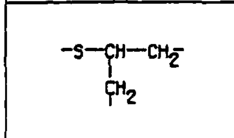
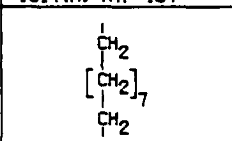
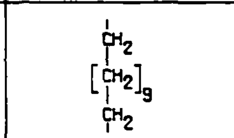
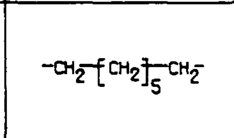
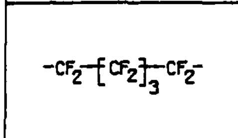
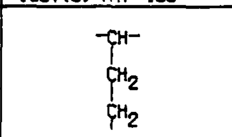
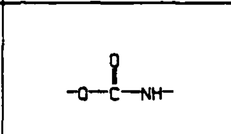
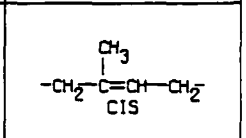
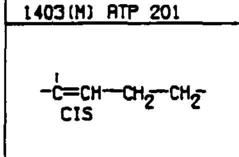
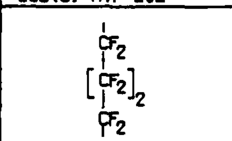
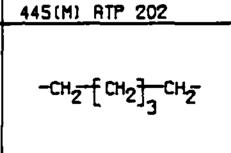
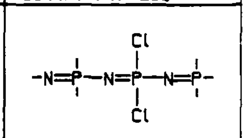
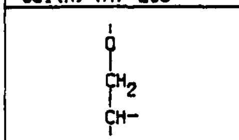
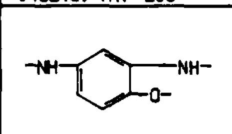
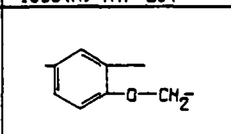
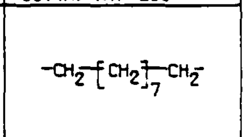
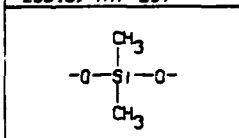
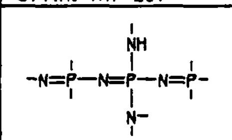
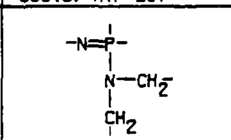
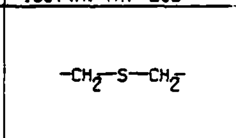
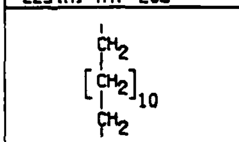
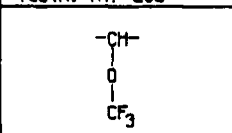
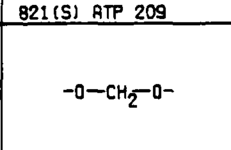
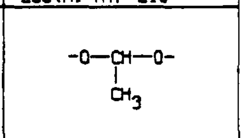
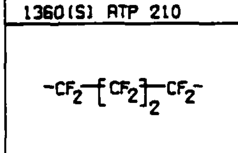
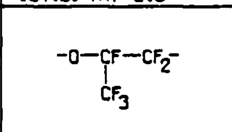
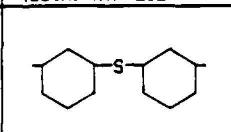
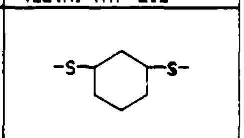
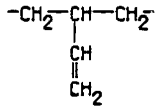
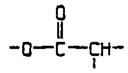
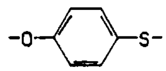
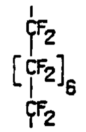
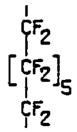
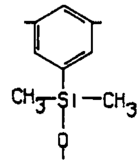
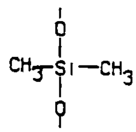
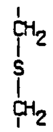
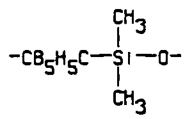
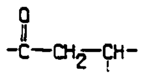
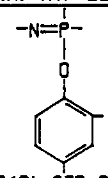
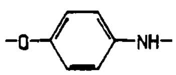
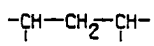
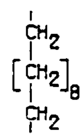
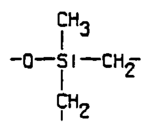
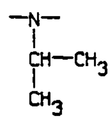
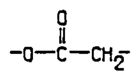
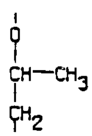
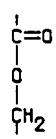
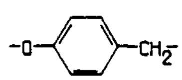
 103(M) ATP 193	 1314(M) ATP 194	 435(M) ATP 195	 4(M) ATP 196
 547(M) ATP 197	 1357(S) ATP 198	 1359(S) ATP 199	 1305(M) ATP 201
 1403(M) ATP 201	 235(S) ATP 202	 445(M) ATP 202	 304(M) ATP 203
 891(M) ATP 203	 1452(S) ATP 203	 1303(M) ATP 204	 637(M) ATP 205
 230(S) ATP 207	 574(M) ATP 207	 586(S) ATP 207	 1307(M) ATP 208
 223(M) ATP 209	 796(M) ATP 209	 821(S) ATP 209	 295(M) ATP 210
 1360(S) ATP 210	 164(S) ATP 213	 426(M) ATP 213	 455(M) ATP 213
 1402(M) ATP 213	 39(M) ATP 214	 578(M) ATP 214	 579(M) ATP 214

$-CH_2-[CH_2]_4-CH_2-$ 1304(M) ATP 215	SYNDIOTACTIC  531(M) ATP 216	 177(M) ATP 218	 1112(M) ATP 218
 1456(S) ATP 219	 1455(S) ATP 221	 915(S) ATP 223	 929(S) ATP 223
 48(S) ATP 224	 742(S) ATP 225	 676(M) ATP 226	$-CH_2-[CH_2]_8-CH_2-$ 1308(M) ATP 226
$-CH_2-[CH_2]_9-CH_2-$ 1309(M) ATP 226	 291(M) ATP 227	 2212(S) ATP 227	$-CH_2-CF_2-CH_2-$ 494(M) ATP 228
 1237(M) ATP 229	 833(M) ATP 230	 1358(S) ATP 230	 467(M) ATP 231
$-S-CH_2-S-$ 543(M) ATP 231	 1241(S) ATP 231	 178(M) ATP 232	 237(S) ATP 232
$-CF_2-[CF_2]_6-CF_2-$ 1406(M) ATP 232	 58(S) ATP 233	$-O-CH_2-CH_2-$ 98(M) ATP 234	 651(M) ATP 234

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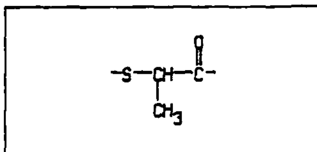
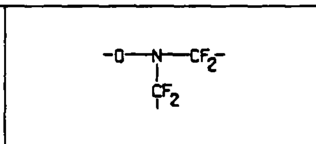
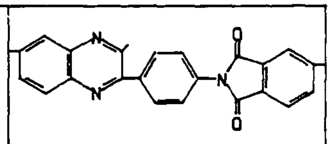
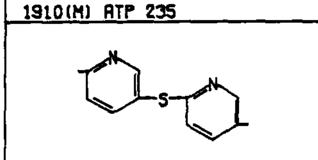
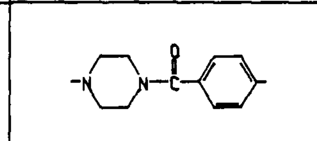
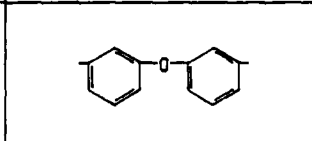
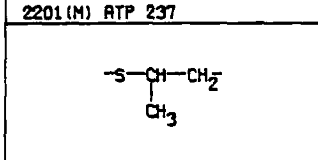
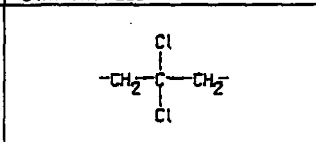
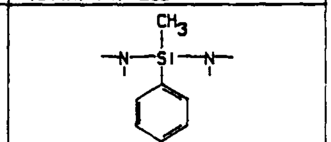
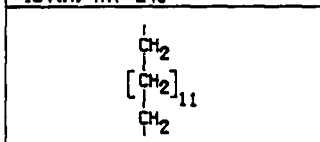
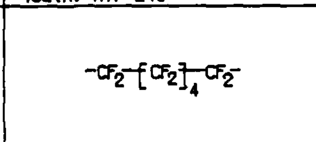
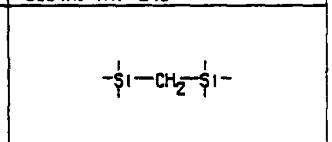
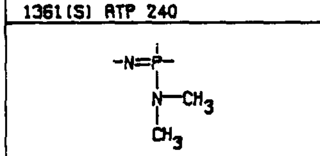
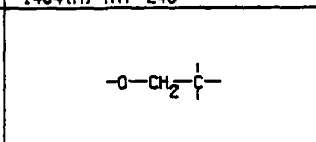
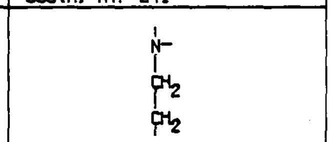
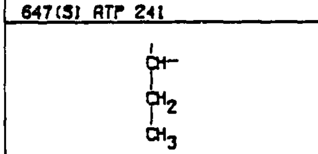
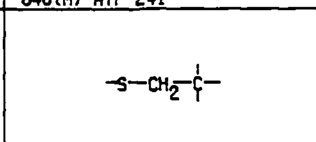
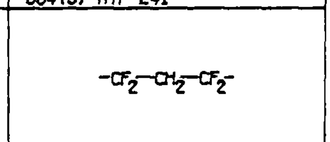
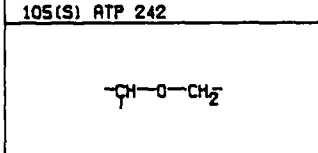
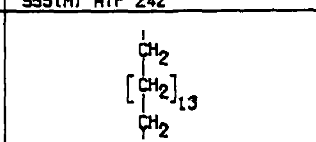
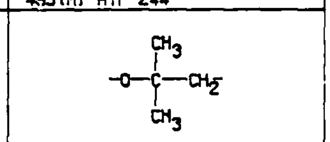
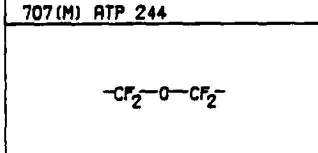
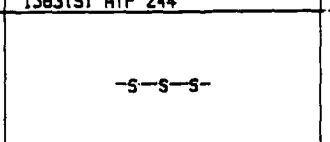
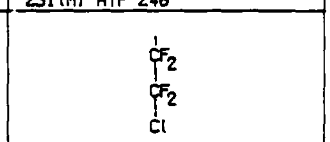
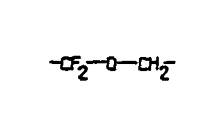
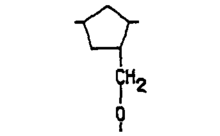
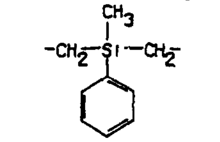
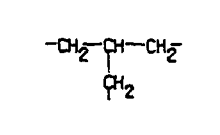
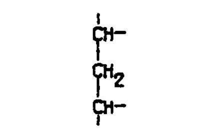
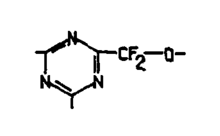
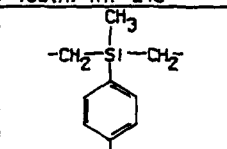
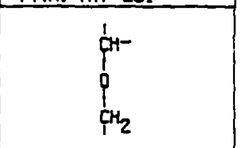
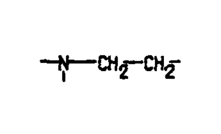
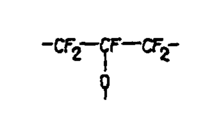
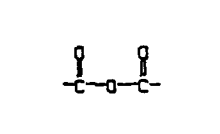
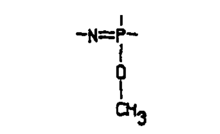
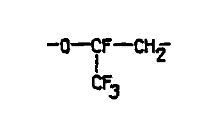
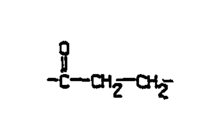
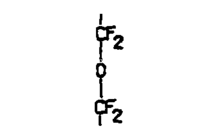
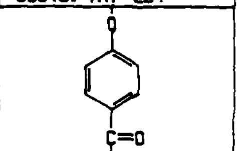
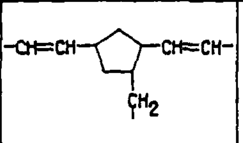
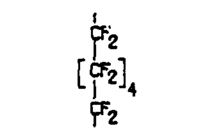
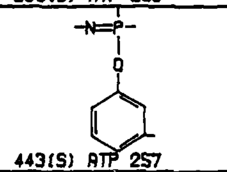
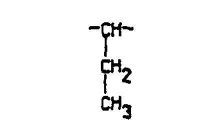
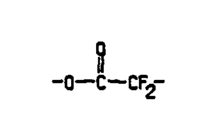
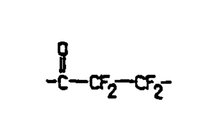
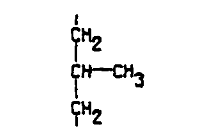
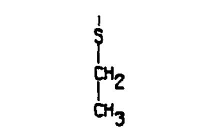
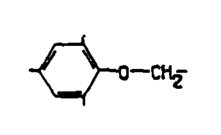
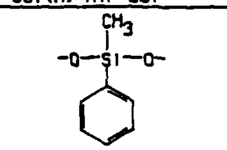
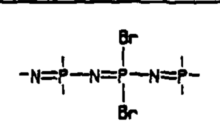
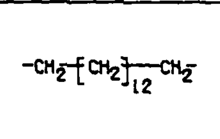
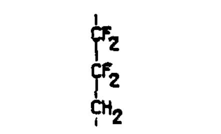
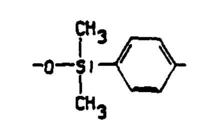
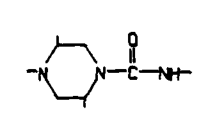
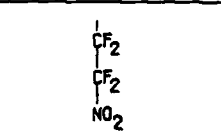
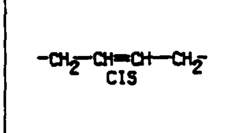
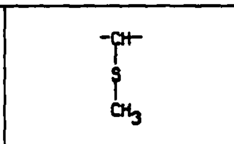
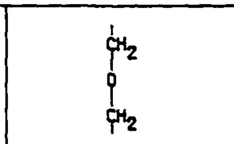
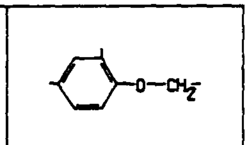
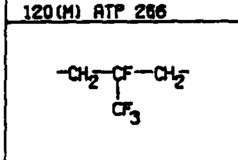
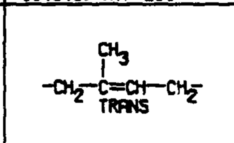
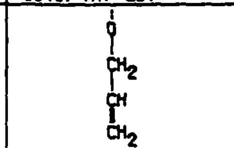
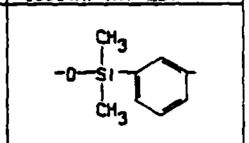
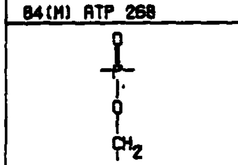
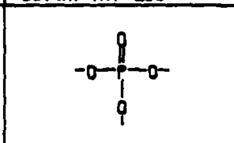
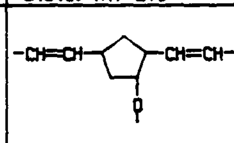
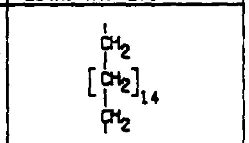
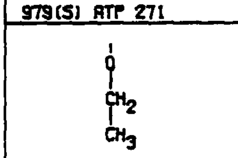
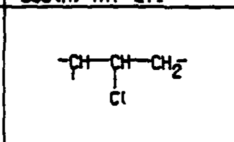
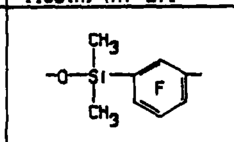
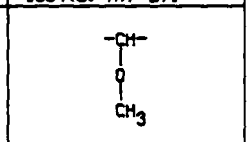
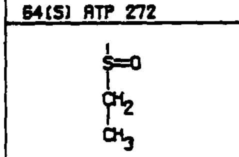
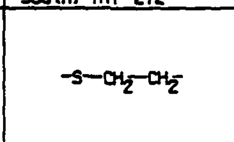
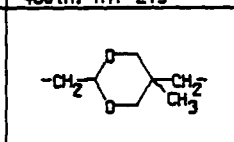
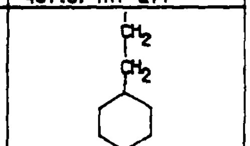
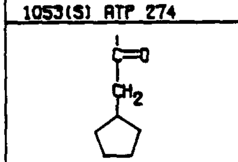
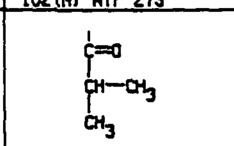
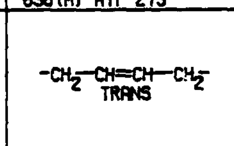
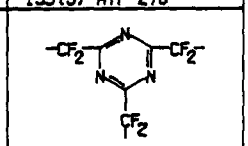
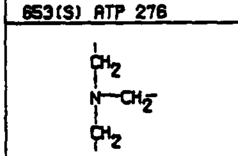
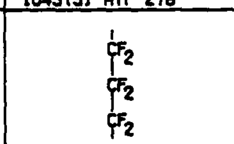
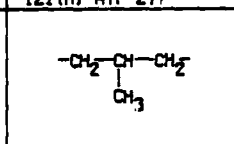
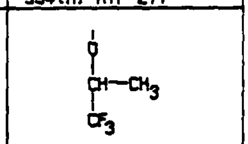
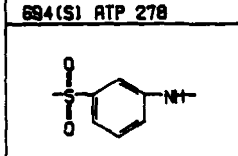
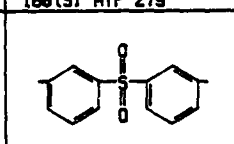
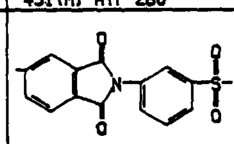
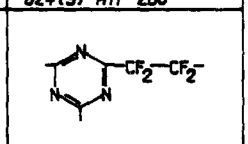
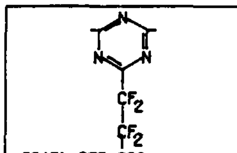
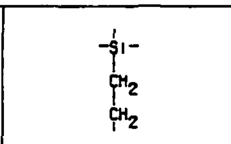
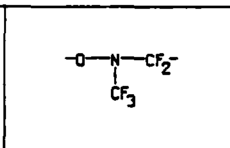
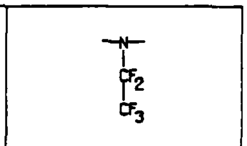
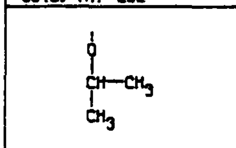
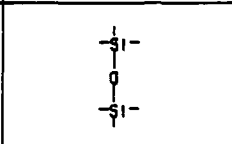
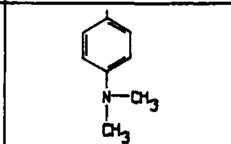
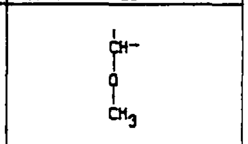
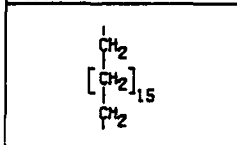
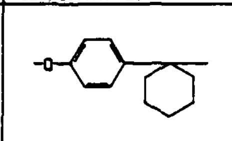
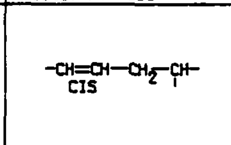
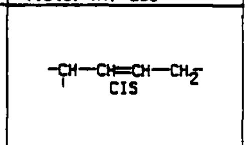
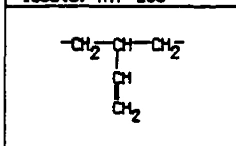
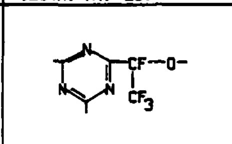
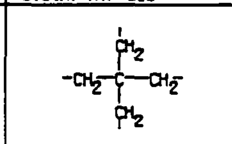
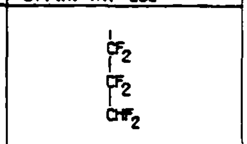
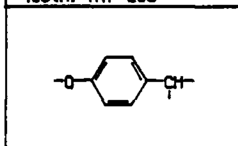
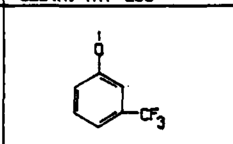
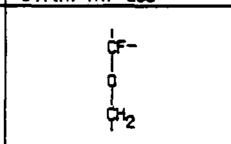
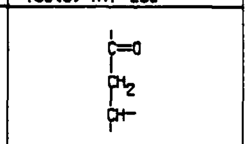
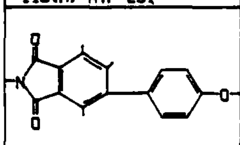
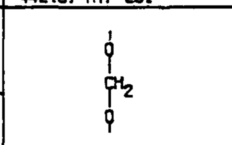
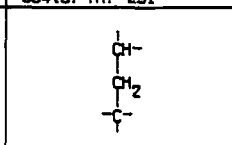
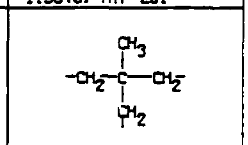
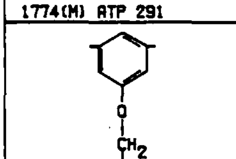
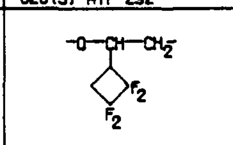
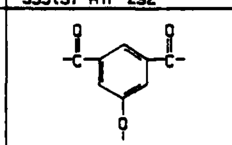
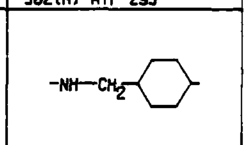
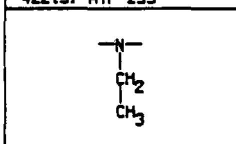
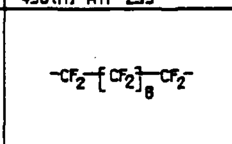
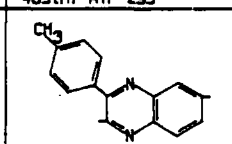
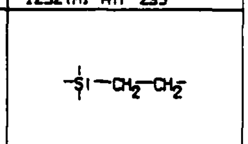
 1910(M) ATP 235	 981(M) ATP 237	 2184(M) ATP 237
 2201(M) ATP 237	 3(M) ATP 238	 454(M) ATP 239
 184(M) ATP 240	 492(M) ATP 240	 608(M) ATP 240
 1361(S) ATP 240	 1404(M) ATP 240	 589(M) ATP 241
 647(S) ATP 241	 846(M) ATP 241	 864(S) ATP 241
 105(S) ATP 242	 555(M) ATP 242	 493(M) ATP 244
 707(M) ATP 244	 1363(S) ATP 244	 231(M) ATP 246
 452(M) ATP 246	 545(M) ATP 246	 609(S) ATP 247

 159(M) ATP 248	 731(S) ATP 249	 759(M) ATP 249	 74(M) ATP 251
 334(S) ATP 252	 525(M) ATP 252	 603(M) ATP 252	 750(S) ATP 253
 1106(M) ATP 253	 55(M) ATP 254	 90(M) ATP 254	 636(S) ATP 254
 2055(M) ATP 255	 14(M) ATP 256	 259(S) ATP 256	 785(S) ATP 256
 1164(M) ATP 256	 1454(S) ATP 256	 443(S) ATP 257	 554(S) ATP 257
 596(M) ATP 257	 597(M) ATP 257	 290(S) ATP 258	 754(S) ATP 258
 1400(M) ATP 258	 266(M) ATP 259	 824(M) ATP 259	 1312(M) ATP 260
 183(S) ATP 263	 710(M) ATP 265	 1920(M) ATP 265	 29(S) ATP 266

 120(M) ATP 266	 1048(S) ATP 266	 63(S) ATP 267	 1301(M) ATP 267
 84(M) ATP 268	 307(M) ATP 268	 549(S) ATP 270	 25(M) ATP 271
 979(S) ATP 271	 988(M) ATP 271	 1166(M) ATP 271	 1364(S) ATP 271
 64(S) ATP 272	 385(M) ATP 272	 460(M) ATP 273	 497(S) ATP 274
 1053(S) ATP 274	 102(M) ATP 275	 658(M) ATP 275	 153(S) ATP 276
 653(S) ATP 276	 1043(S) ATP 276	 121(M) ATP 277	 594(M) ATP 277
 694(S) ATP 278	 166(S) ATP 279	 431(M) ATP 280	 624(S) ATP 280
 1763(M) ATP 280	 1764(M) ATP 280	 1765(M) ATP 280	 592(M) ATP 281

 80(S) ATP 282	 884(S) ATP 282	 33(M) ATP 284	 45(S) ATP 284
 239(S) ATP 284	 925(S) ATP 284	 606(S) ATP 285	 716(S) ATP 285
 1365(S) ATP 285	 129(M) ATP 287	 375(M) ATP 288	 377(M) ATP 288
 403(M) ATP 289	 529(M) ATP 289	 847(M) ATP 289	 790(S) ATP 290
 115(M) ATP 291	 442(S) ATP 291	 584(S) ATP 291	 1138(S) ATP 291
 1774(M) ATP 291	 826(S) ATP 292	 933(S) ATP 292	 382(M) ATP 293
 422(S) ATP 293	 436(M) ATP 293	 483(M) ATP 293	 1232(M) ATP 293
 700(S) ATP 295	 1408(M) ATP 295	 1574(S) ATP 295	 468(M) ATP 296

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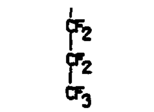
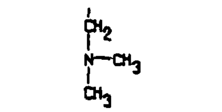
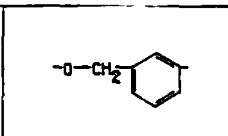
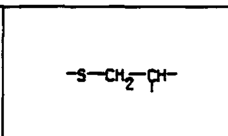
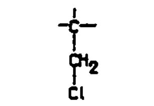
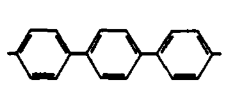
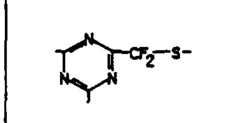
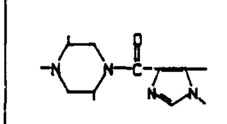
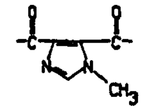
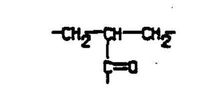
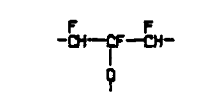
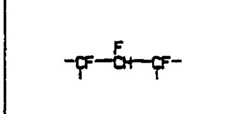
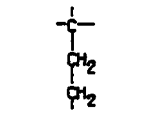
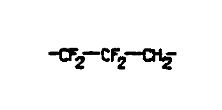
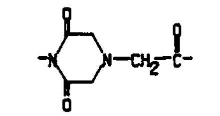
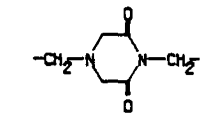
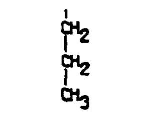
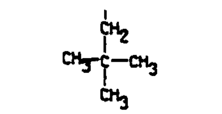
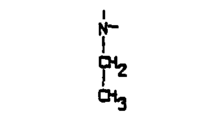
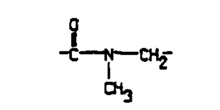
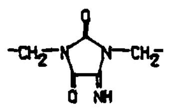
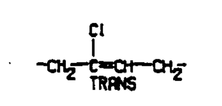
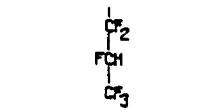
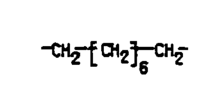
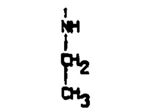
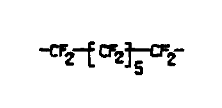
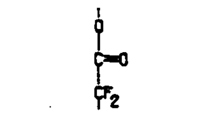
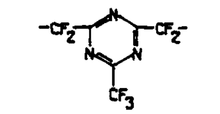
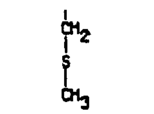
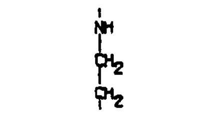
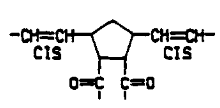
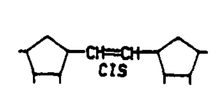
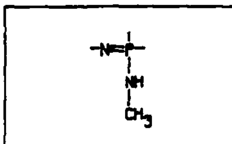
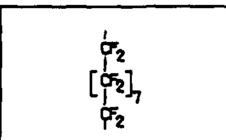
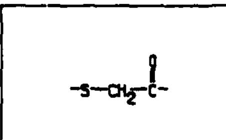
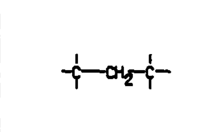
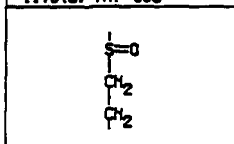
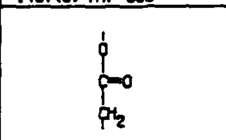
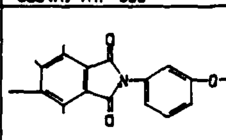
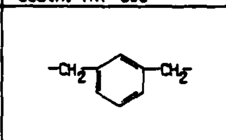
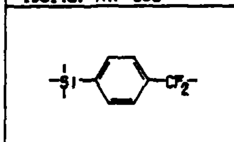
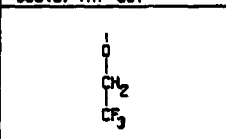
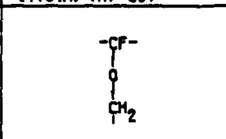
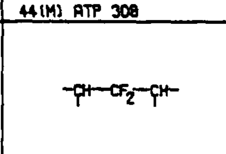
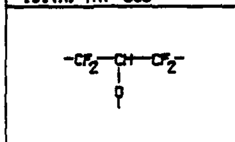
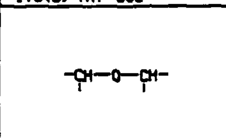
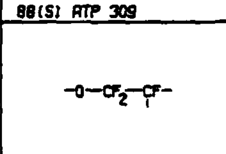
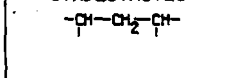
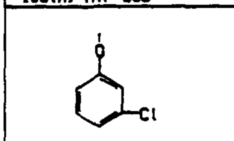
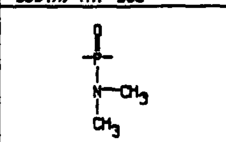
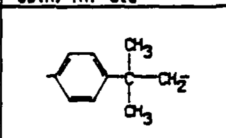
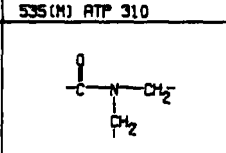
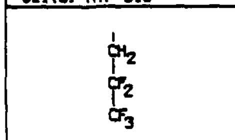
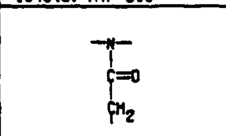
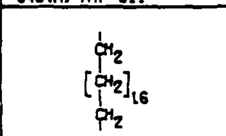
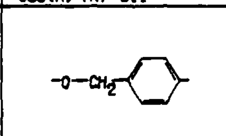
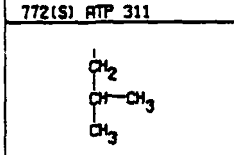
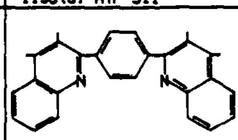
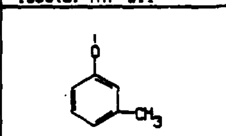
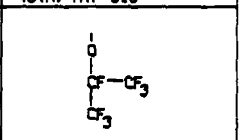
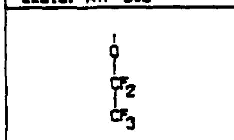
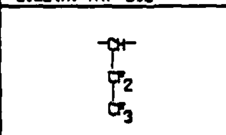
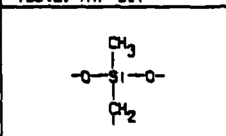
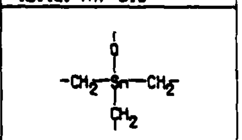
 768(S) ATP 296	 1070(S) ATP 296	 43(M) ATP 297	 551(M) ATP 297
 848(S) ATP 297	 1531(M) ATP 297	 526(M) ATP 298	 1925(M) ATP 298
 1926(M) ATP 298	 58(M) ATP 299	 132(M) ATP 299	 134(M) ATP 299
 810(S) ATP 299	 10(M) ATP 300	 1941(M) ATP 300	 1942(M) ATP 300
 72(S) ATP 301	 619(S) ATP 301	 693(S) ATP 301	 706(M) ATP 301
 1991(M) ATP 301	 139(M) ATP 303	 778(S) ATP 303	 1306(M) ATP 303
 819(S) ATP 304	 1405(M) ATP 304	 180(S) ATP 305	 595(M) ATP 305
 752(S) ATP 305	 985(S) ATP 305	 1162(M) ATP 305	 1163(M) ATP 305

 1170(S) ATP 305	 1457(S) ATP 305	 583(M) ATP 306	 809(M) ATP 306
 1051(S) ATP 306	 639(S) ATP 307	 1770(M) ATP 307	 44(M) ATP 308
 131(M) ATP 308	 179(S) ATP 308	 88(S) ATP 309	 135(M) ATP 309
 138(M) ATP 309	 930(M) ATP 309	 36(M) ATP 310	SYNDIOTACTIC  535(M) ATP 310
 621(S) ATP 310	 1046(S) ATP 310	 646(M) ATP 311	 899(M) ATP 311
 772(S) ATP 311	 1135(S) ATP 311	 1366(S) ATP 311	 46(M) ATP 313
 229(S) ATP 313	 2158(M) ATP 315	 793(S) ATP 317	 191(S) ATP 318
 778(S) ATP 318	 194(S) ATP 319	 283(M) ATP 319	 780(S) ATP 319

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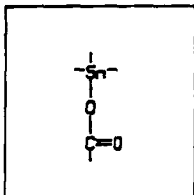
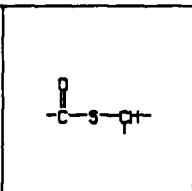
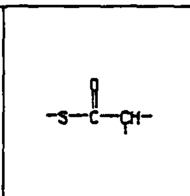
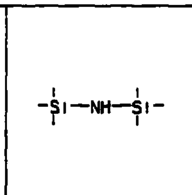
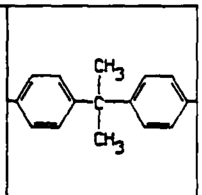
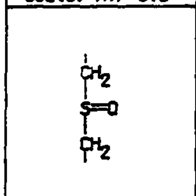
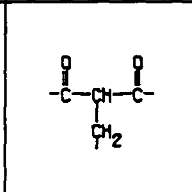
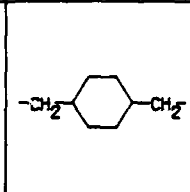
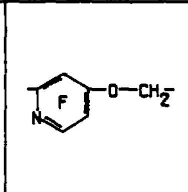
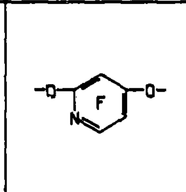
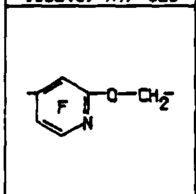
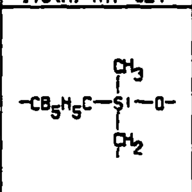
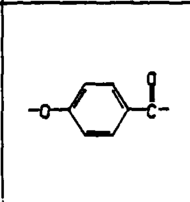
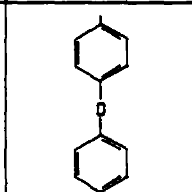
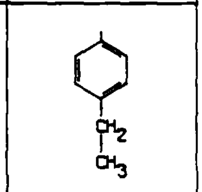
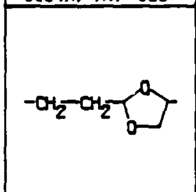
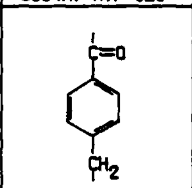
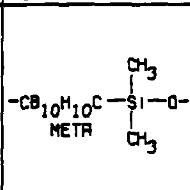
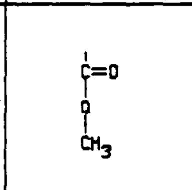
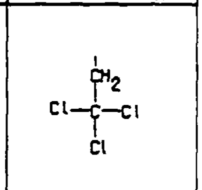
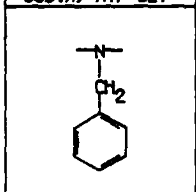
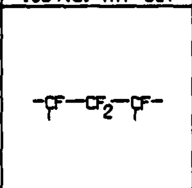
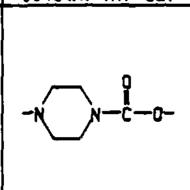
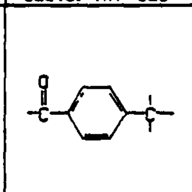
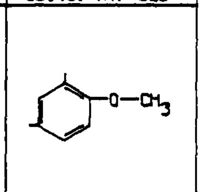
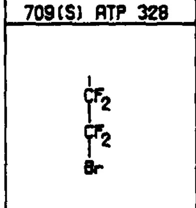
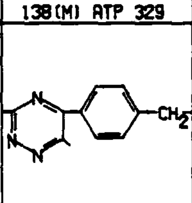
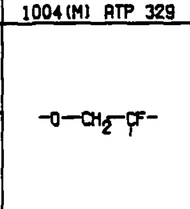
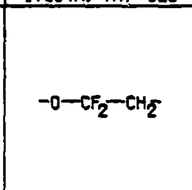
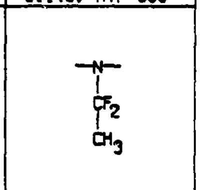
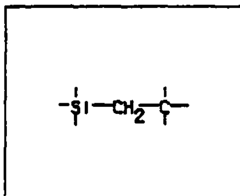
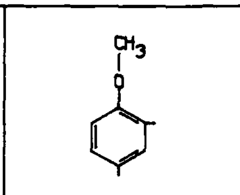
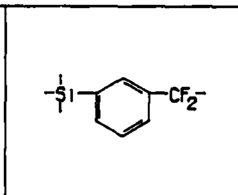
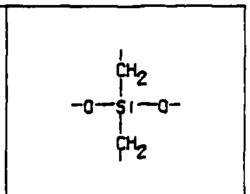
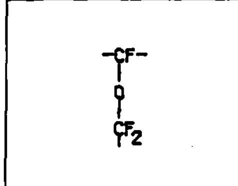
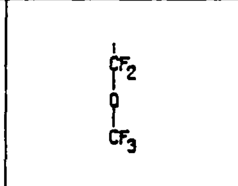
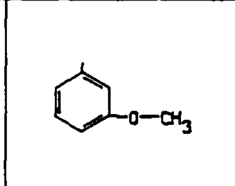
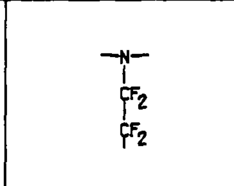
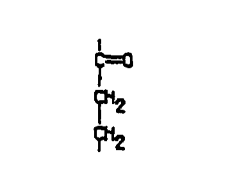
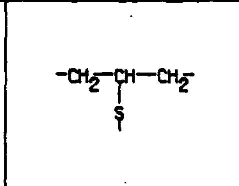
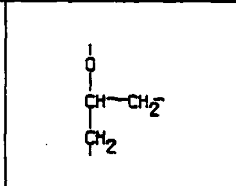
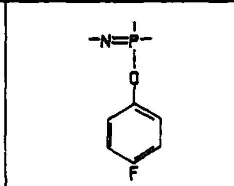
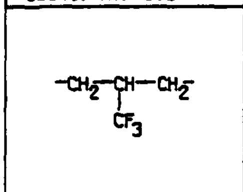
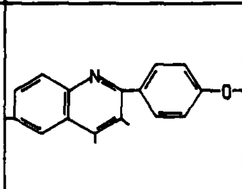
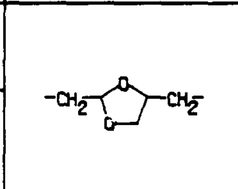
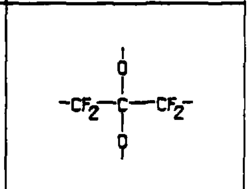
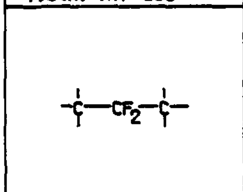
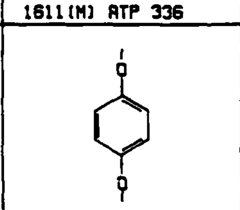
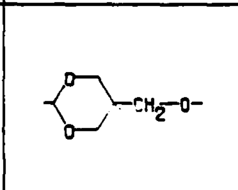
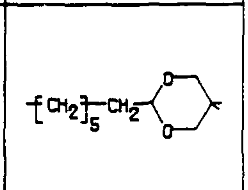
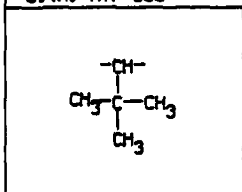
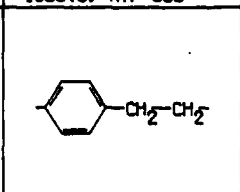
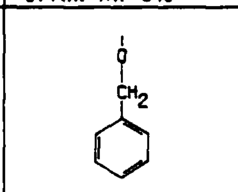
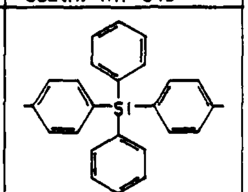
 802(S) ATP 319	 1909(M) ATP 320	 1911(M) ATP 320	 602(M) ATP 321	 89(M) ATP 323
 1052(S) ATP 323	 176(M) ATP 324	 1233(M) ATP 324	 141(M) ATP 325	 144(M) ATP 325
 816(M) ATP 325	 888(M) ATP 325	 92(M) ATP 326	 383(S) ATP 326	 542(S) ATP 326
 656(M) ATP 327	 1034(S) ATP 327	 1143(M) ATP 327	 328(S) ATP 328	 581(S) ATP 328
 709(S) ATP 328	 138(M) ATP 329	 1004(M) ATP 329	 1790(M) ATP 329	 311(S) ATP 330
 509(S) ATP 330	 1866(M) ATP 330	 2054(M) ATP 330	 203(M) ATP 331	 507(S) ATP 331

 1015(M) ATP 331	 1173(S) ATP 332	 127(M) ATP 333	 521(M) ATP 333
 140(S) ATP 334	 256(S) ATP 334	 1032(S) ATP 334	 28(S) ATP 335
 638(S) ATP 335	 1047(M) ATP 335	 332(S) ATP 336	 439(S) ATP 336
 715(M) ATP 336	 1611(M) ATP 336	 655(M) ATP 337	 50(M) ATF 339
 51(M) ATP 339	 1059(S) ATP 339	 674(M) ATP 340	 692(M) ATP 340
 2042(S) ATP 340	 540(M) ATP 341	 640(S) ATP 341	 1723(M) ATP 341

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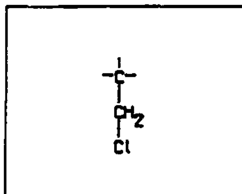
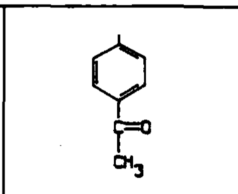
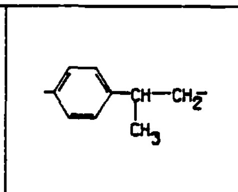
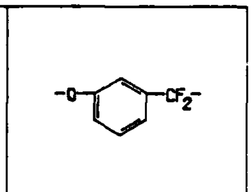
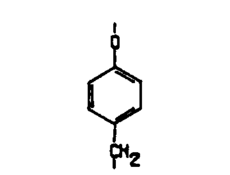
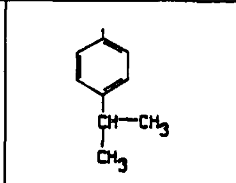
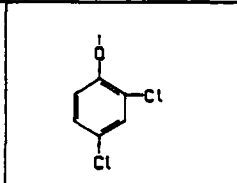
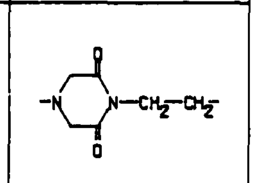
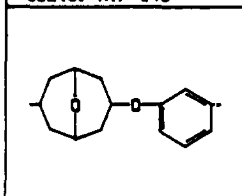
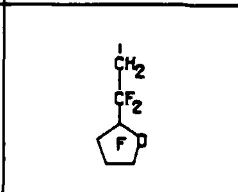
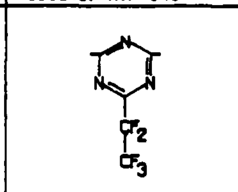
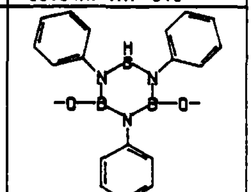
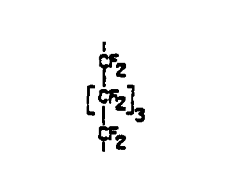
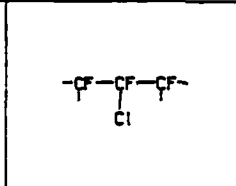
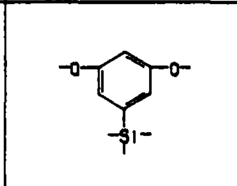
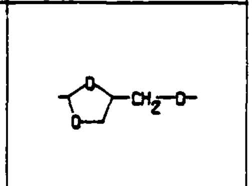
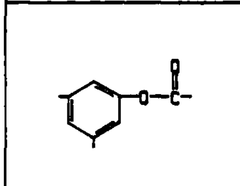
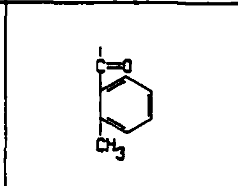
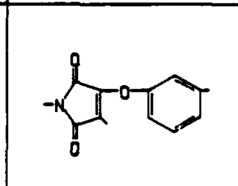
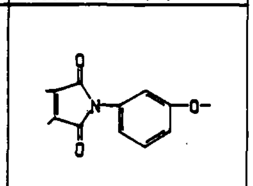
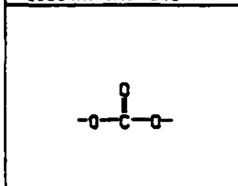
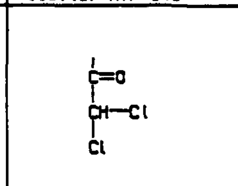
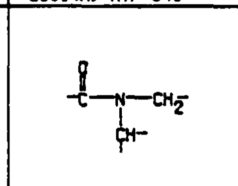
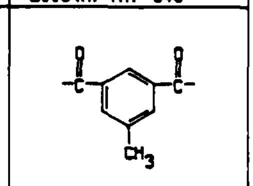
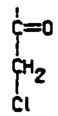
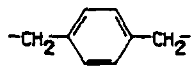
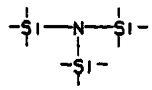
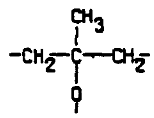
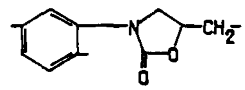
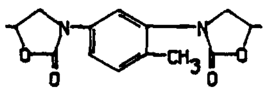
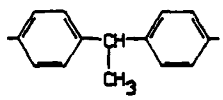
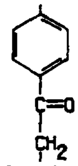
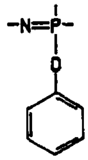
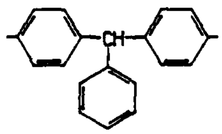
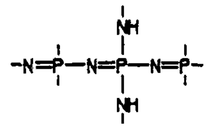
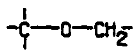
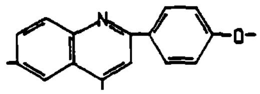
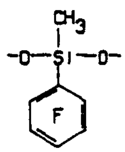
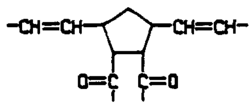
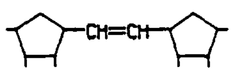
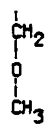
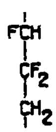
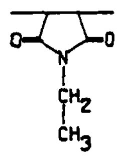
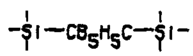
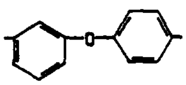
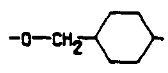
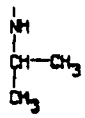
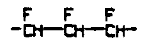
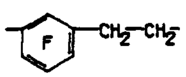
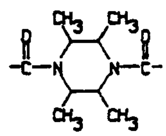
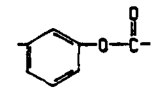
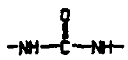
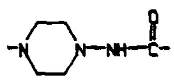
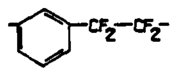
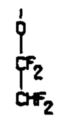
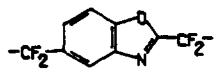
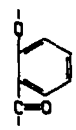
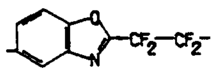
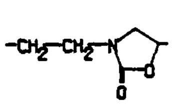
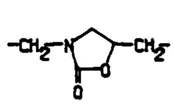
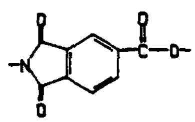
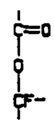
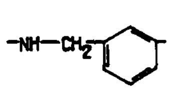
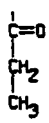
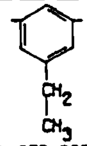
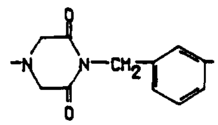
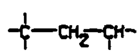
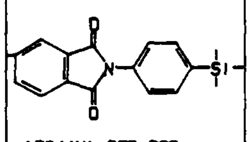
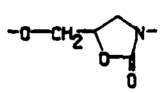
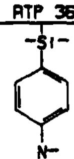
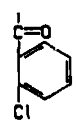
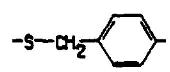
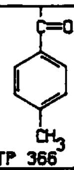
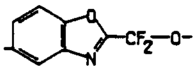
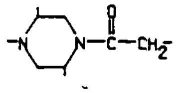
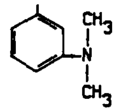
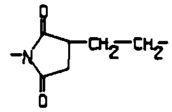
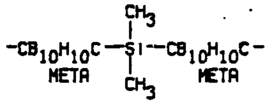
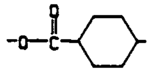
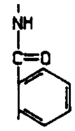
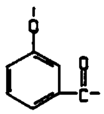
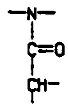
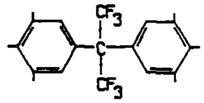
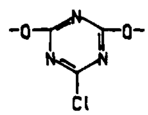
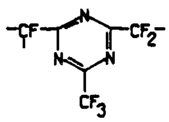
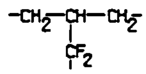
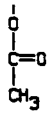
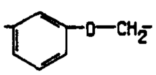
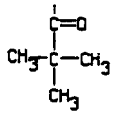
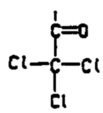
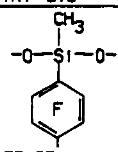
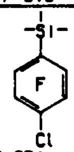
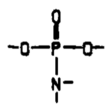
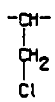
 2032(S) ATP 341	 300(S) ATP 342	 649(M) ATP 342	 800(M) ATP 342
 632(S) ATP 343	 1022(S) ATP 343	 1062(S) ATP 343	 1876(M) ATP 343
 2016(M) ATP 343	 470(S) ATP 344	 477(S) ATP 344	 1263(M) ATP 344
 1453(S) ATP 344	 169(M) ATP 345	 905(M) ATP 345	 669(M) ATP 346
 1006(M) ATP 346	 1037(S) ATP 346	 2011(M) ATP 346	 2113(M) ATP 346
 110(M) ATP 347	 1045(S) ATP 347	 1240(M) ATP 347	 1017(M) ATP 348

 338(S) ATP 349	 539(M) ATP 350	 610(M) ATP 350
 1073(S) ATP 350	 1074(M) ATP 350	 1215(M) ATP 350
 2179(M) ATP 350	 128(M) ATP 352	 303(S) ATP 352
 629(S) ATP 352	 712(M) ATP 352	 822(M) ATP 352
 877(M) ATP 352	 1620(M) ATP 352	 462(M) ATP 353
 1168(M) ATP 353	 1169(M) ATP 353	 61(S) ATP 354
 777(S) ATP 354	 2030(S) ATP 354	 675(M) ATP 355

 1738(M) ATP 355	 1900(M) ATP 355	 405(S) ATP 356	 761(M) ATP 356
 871(M) ATP 356	 1761(M) ATP 356	 1956(M) ATP 356	 801(M) ATP 357
 1954(M) ATP 357	 1955(M) ATP 357	 795(M) ATP 358	 253(S) ATP 359
 265(S) ATP 359	 791(M) ATP 359	 1029(S) ATP 359	 1050(M) ATP 359
 1213(M) ATP 359	 1211(M) ATP 360	 1710(M) ATP 360	 190(S) ATP 362
 523(M) ATP 362	 683(S) ATP 362	 993(S) ATP 362	 1944(M) ATP 362
 614(S) ATP 363	 627(M) ATP 363	 1142(S) ATP 363	 1724(M) ATP 363
 1204(M) ATP 364	 605(S) ATP 365	 686(S) ATP 365	 559(M) ATP 366

 1035(S) ATP 366	 1111(M) ATP 366	 1917(M) ATP 366
$-CF_2-CH_2-CH_2-$ 469(M) ATP 367	 1065(S) ATP 367	 1993(M) ATP 367
 2013(M) ATP 367	 599(M) ATP 368	 299(S) ATP 369
 1031(S) ATP 369	 1136(S) ATP 369	 2145(M) ATP 370
 1812(M) ATP 371	 528(M) ATP 372	 107(M) ATP 373
 457(S) ATP 373	 541(M) ATP 373	 1021(S) ATP 373
 1044(S) ATP 373	$-NH-CH_2-CH_2-$ 12(M) ATP 374	 734(M) ATP 374
 746(S) ATP 374	 994(M) ATP 374	 575(S) ATP 376

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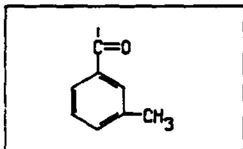
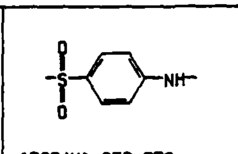
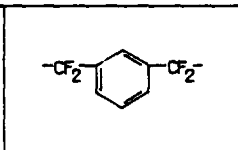
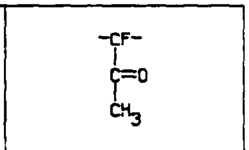
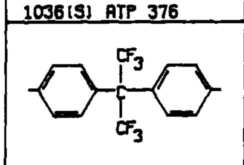
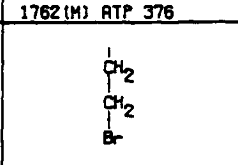
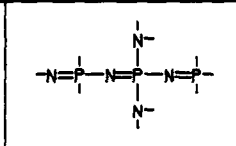
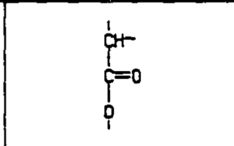
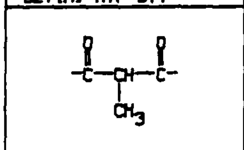
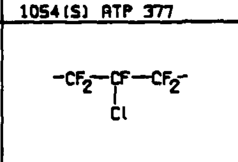
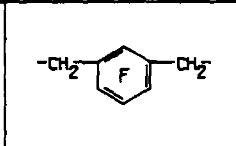
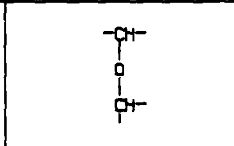
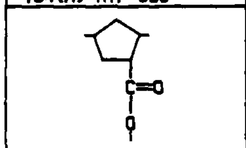
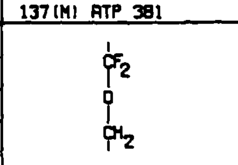
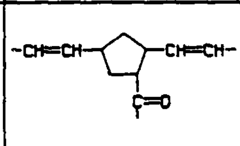
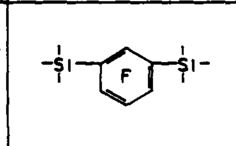
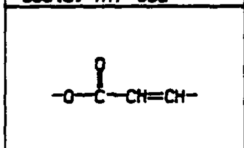
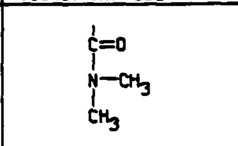
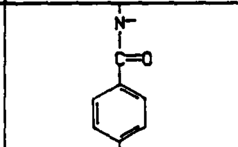
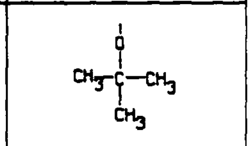
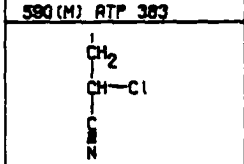
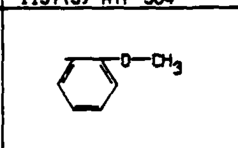
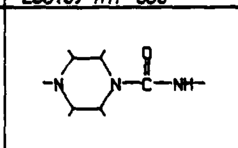
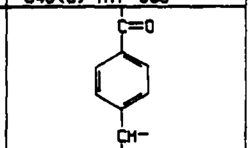
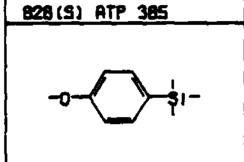
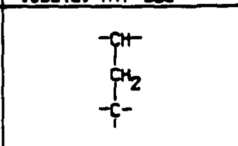
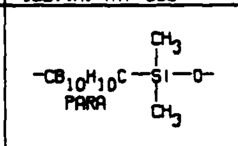
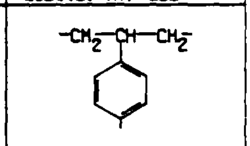
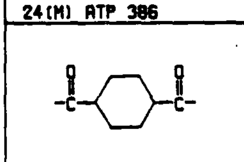
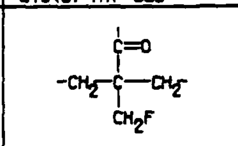
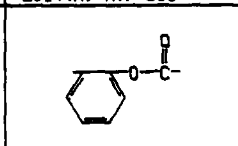
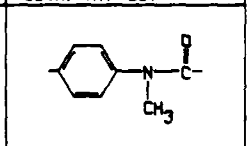
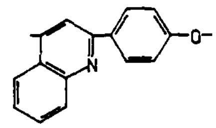
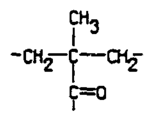
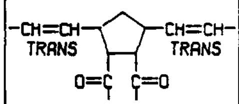
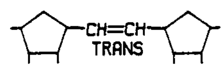
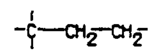
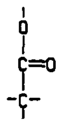
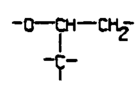
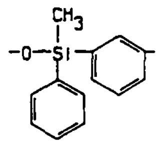
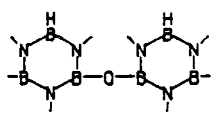
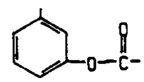
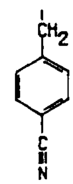
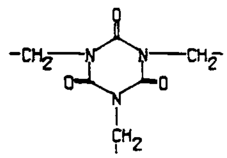
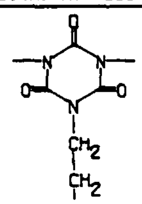
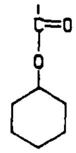
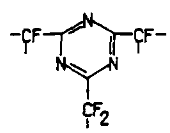
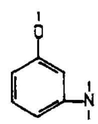
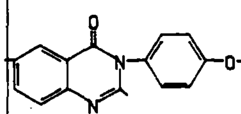
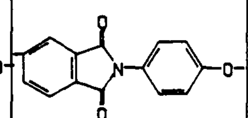
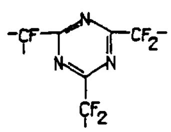
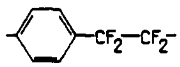
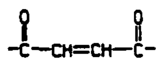
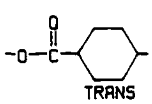
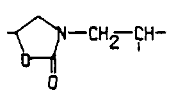
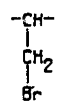
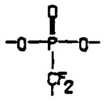
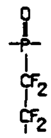
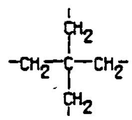
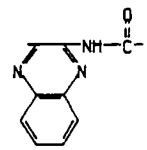
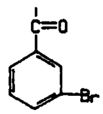
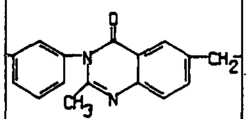
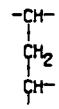
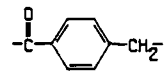
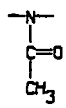
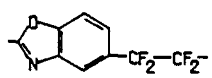
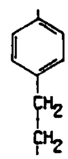
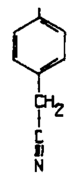
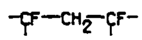
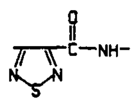
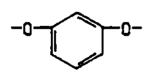
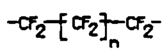
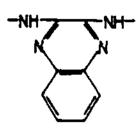
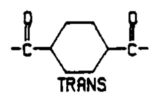
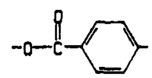
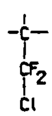
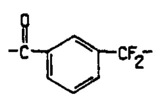
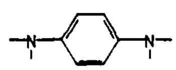
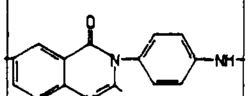
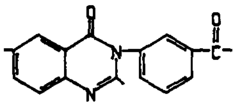
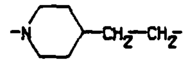
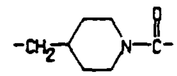
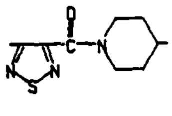
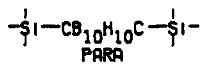
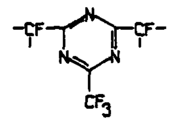
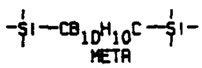
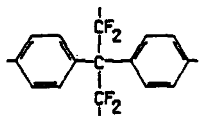
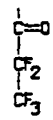
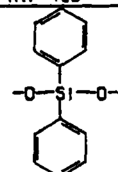
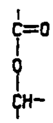
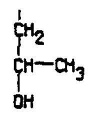
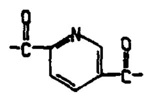
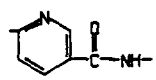
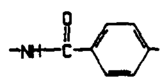
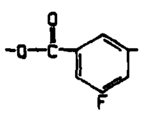
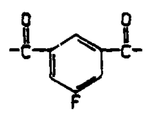
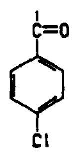
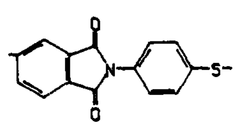
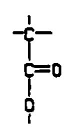
 1036(S) ATP 376	 1762(M) ATP 376	 157(M) ATP 377	 732(S) ATP 377
 827(M) ATP 377	 1054(S) ATP 377	 644(M) ATP 378	 2051(S) ATP 379
 784(M) ATP 380	 137(M) ATP 381	 890(M) ATP 381	 1049(S) ATP 381
 688(S) ATP 382	 718(S) ATP 382	 1167(M) ATP 382	 461(M) ATP 383
 590(M) ATP 383	 1157(S) ATP 384	 298(S) ATP 385	 340(S) ATP 385
 828(S) ATP 385	 1033(S) ATP 385	 1957(M) ATP 385	 2050(S) ATP 385
 24(M) ATP 386	 576(S) ATP 386	 2014(M) ATP 386	 66(M) ATP 387
 601(M) ATP 387	 788(M) ATP 387	 1030(S) ATP 387	 1242(M) ATP 387

 1629(M) ATP 388	 148(M) ATP 389	 689(M) ATP 389	 690(M) ATP 389
 830(M) ATP 389	 851(S) ATP 389	 973(M) ATP 389	 1152(M) ATP 389
 1261(M) ATP 390	 5(S) ATP 391	 1061(S) ATP 391	 1913(M) ATP 391
 1914(S) ATP 391	 319(S) ATP 392	 711(M) ATP 392	 1064(S) ATP 392
 1297(M) ATP 392	 1698(M) ATP 392	 725(M) ATP 393	 997(M) ATP 393
 591(M) ATP 394	 1905(M) ATP 394	 2180(M) ATP 394	 573(S) ATP 395

 989(M) ATP 395	 990(S) ATP 395	 1068(S) ATP 395	 1593(M) ATP 395
 1041(S) ATP 396	 1290(M) ATP 396	 2031(S) ATP 396	 93(M) ATP 397
 1133(S) ATP 397	 1063(M) ATP 398	 71(S) ATP 399	 829(S) ATP 399
 1124(M) ATP 399	 1228(M) ATP 399	 903(S) ATP 400	 1071(M) ATP 400
 1421(M) ATP 400	 1592(M) ATP 400	 1904(M) ATP 400	 87(M) ATP 401
 173(S) ATP 401	 794(M) ATP 401	 1243(M) ATP 401	 1292(M) ATP 401

 2187(M) ATP 401	 1254(M) ATP 402	 1255(M) ATP 402
 1257(M) ATP 402	 2015(M) ATP 402	 724(M) ATP 403
 1144(M) ATP 403	 171(M) ATP 404	 185(S) ATP 404
 226(M) ATP 404	 232(S) ATP 404	 1075(S) ATP 404
 1958(M) ATP 404	 1959(M) ATP 404	 104(M) ATP 405
 117(M) ATP 405	 124(M) ATP 405	 995(S) ATP 405
 1038(S) ATP 405	 1740(M) ATP 405	 615(S) ATP 406

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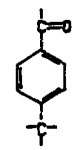
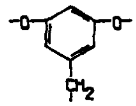
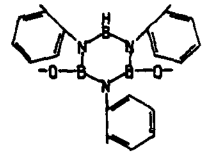
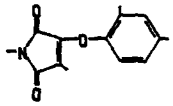
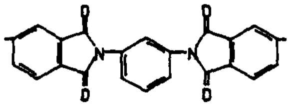
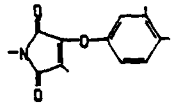
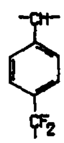
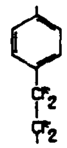
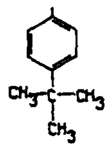
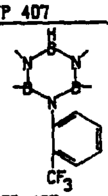
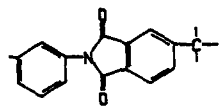
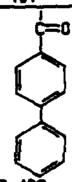
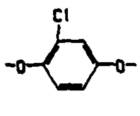
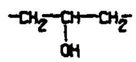
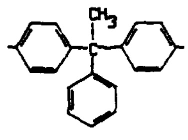
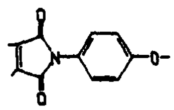
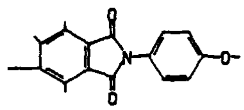
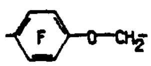
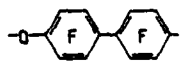
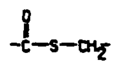
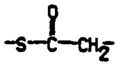
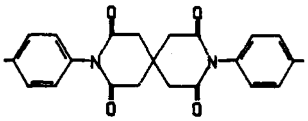
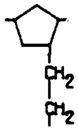
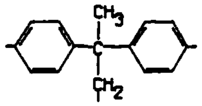
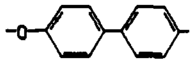
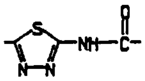
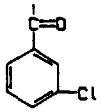
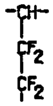
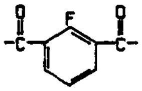
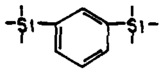
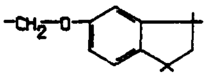
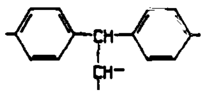
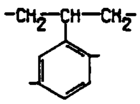
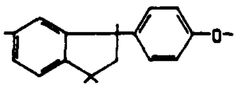
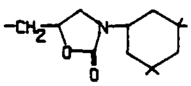
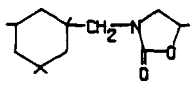
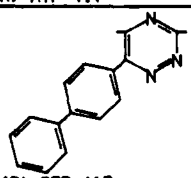
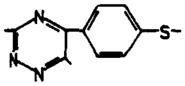
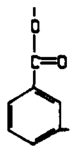
 838(S) ATP 406	 1010(M) ATP 406	 1260(M) ATP 406
 2003(M) ATP 406	 2197(M) ATP 406	 2203(M) ATP 406
 113(S) ATP 407	 114(S) ATP 407	 909(S) ATP 407
 1262(S) ATP 407	 1736(M) ATP 407	 1023(S) ATP 408
 2005(M) ATP 408	 503(M) ATP 409	 654(M) ATP 409
 1238(M) ATP 409	 2010(M) ATP 409	 1775(M) ATP 410
 205(M) ATP 411	 207(M) ATP 411	 424(M) ATP 412

 556(M) ATP 412	 1602(M) ATP 412	 679(S) ATP 413
 782(S) ATP 414	 839(M) ATP 414	 1113(M) ATP 414
 1239(M) ATP 414	 367(S) ATP 415	 1039(S) ATP 415
 108(S) ATP 416	 125(M) ATP 416	 1151(M) ATP 416
 682(M) ATP 417	 842(M) ATP 417	 856(M) ATP 417
 959(M) ATP 417	 1218(M) ATP 417	 1220(M) ATP 417
 1819(S) ATP 417	 1844(M) ATP 417	 1024(S) ATP 418

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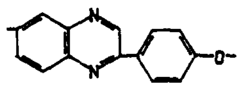
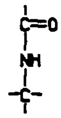
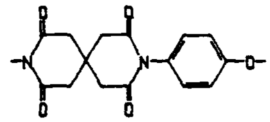
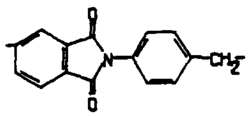
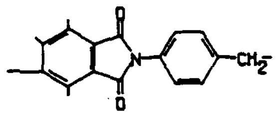
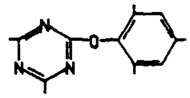
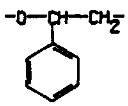
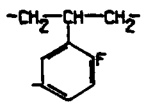
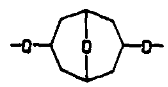
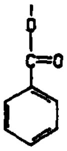
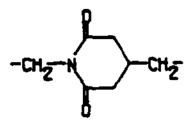
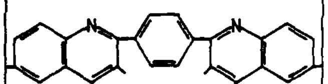
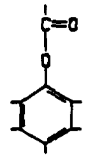
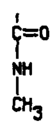
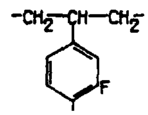
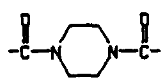
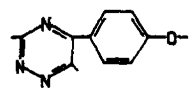
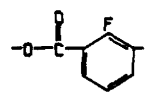
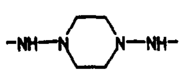
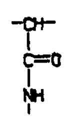
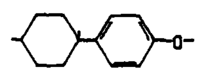
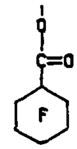
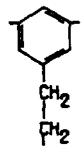
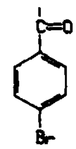
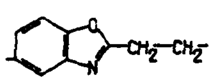
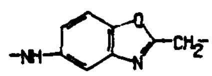
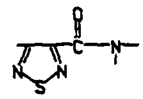
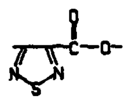
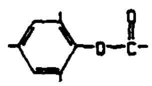
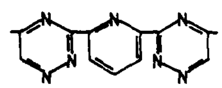
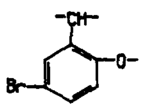
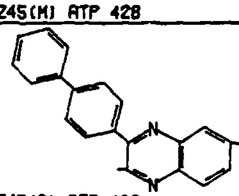
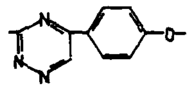
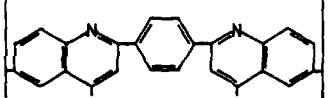
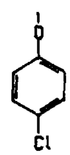
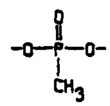
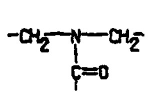
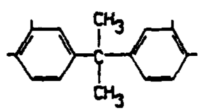
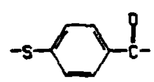
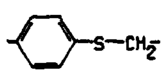
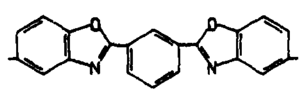
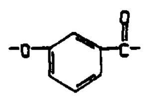
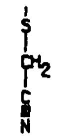
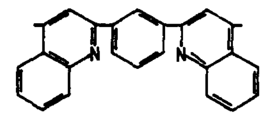
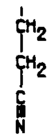
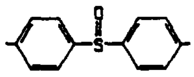
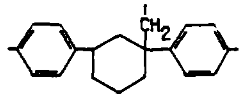
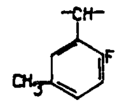
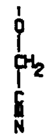
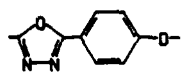
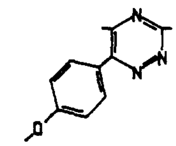
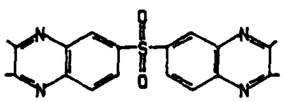
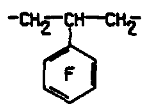
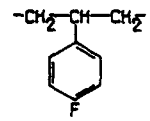
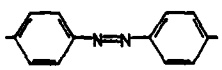
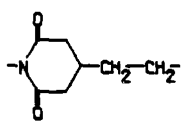
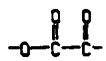
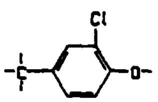
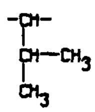
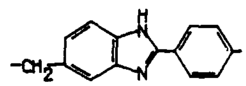
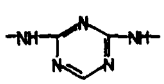
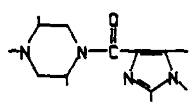
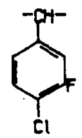
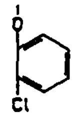
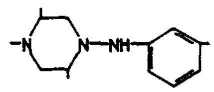
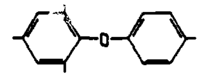
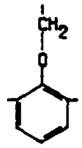
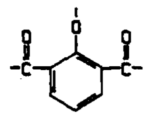
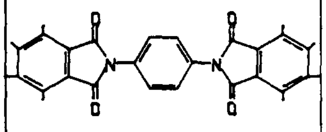
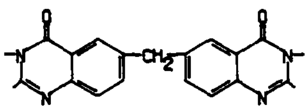
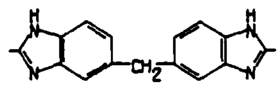
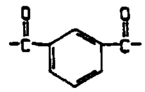
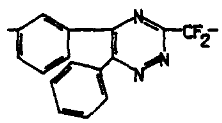
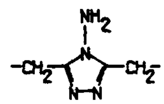
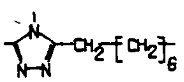
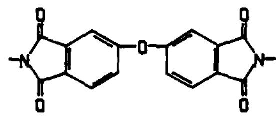
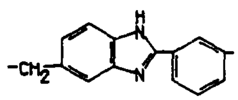
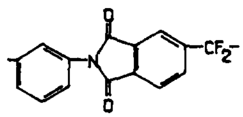
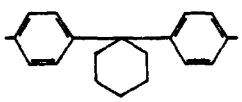
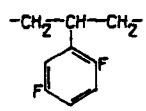
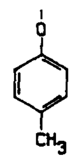
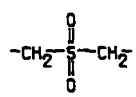
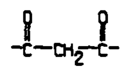
 1530(M) ATP 419	 399(S) ATP 420	 1603(M) ATP 420
 1697(M) ATP 420	 1777(M) ATP 420	 1855(M) ATP 420
 708(M) ATP 421	 1148(M) ATP 421	 1948(M) ATP 421
 684(S) ATP 422	 1966(M) ATP 422	 2157(M) ATP 422
 1056(S) ATP 423	 316(S) ATP 424	 1149(M) ATP 424
 438(M) ATP 425	 1824(M) ATP 425	 126(M) ATP 426
 1953(M) ATP 426	 394(S) ATP 427	 660(M) ATP 427

 187(S) ATP 428	 1009(S) ATP 428	 1040(S) ATP 428
 1184(M) ATP 428	 1185(M) ATP 428	 1227(M) ATP 428
 1244(M) ATP 428	 1245(M) ATP 428	 2200(M) ATP 428
 274(S) ATP 429	 1547(S) ATP 429	 1809(M) ATP 430
 2160(M) ATP 430	 634(S) ATP 431	 992(M) ATP 431
 1134(M) ATP 431	 2132(M) ATP 431	 94(M) ATP 432
 101(M) ATP 432	 2169(M) ATP 432	 95(M) ATP 433

 745(S) ATP 433	 2161(M) ATP 433	 743(S) ATP 435
 1108(M) ATP 435	 663(M) ATP 436	 820(S) ATP 436
 870(S) ATP 436	 1102(M) ATP 436	 1817(S) ATP 436
 2183(M) ATP 436	 85(M) ATP 437	 1150(M) ATP 437
 1110(M) ATP 438	 1965(M) ATP 438	 544(M) ATP 439
 955(M) ATP 439	 419(S) ATP 441	 1642(M) ATP 441
 1695(M) ATP 441	 1918(M) ATP 441	 355(S) ATP 442

 1060(S) ATP 442	 1937(M) ATP 442	 2044(M) ATP 442
 481(S) ATP 443	 490(M) ATP 443	 2077(M) ATP 443
 2154(M) ATP 443	 2164(M) ATP 443	 243(M) ATP 444
 1846(M) ATP 444	 1967(M) ATP 444	 1968(M) ATP 444
 1156(M) ATP 445	 1639(M) ATP 445	 1725(M) ATP 445
 130(M) ATP 446	 172(M) ATP 446	 628(S) ATP 446
 1543(S) ATP 446	 2047(M) ATP 446	 174(M) ATP 447

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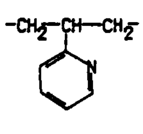
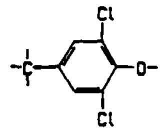
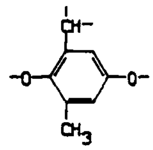
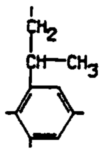
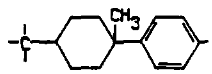
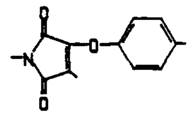
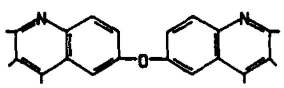
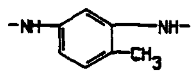
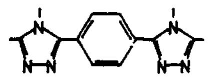
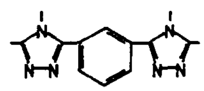
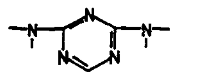
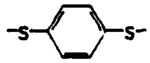
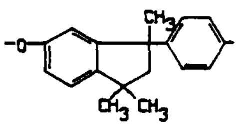
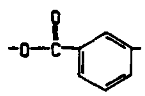
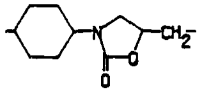
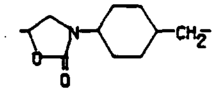
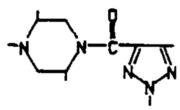
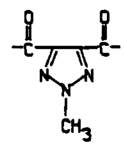
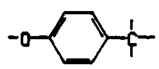
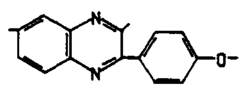
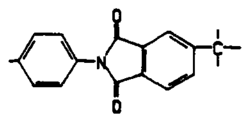
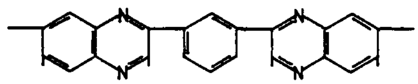
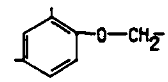
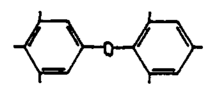
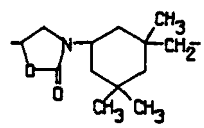
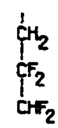
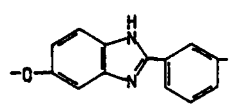
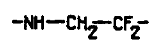
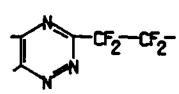
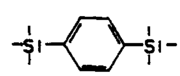
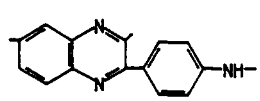
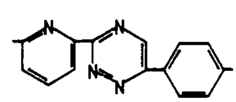
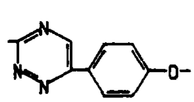
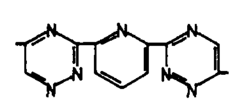
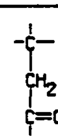
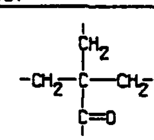
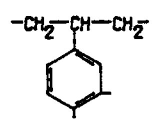
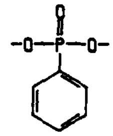
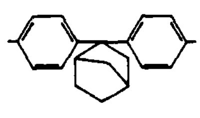
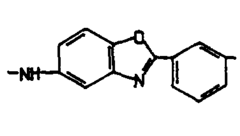
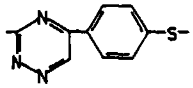
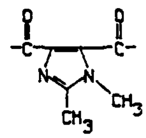
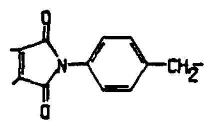
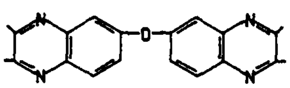
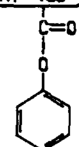
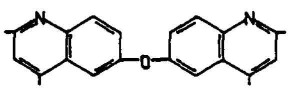
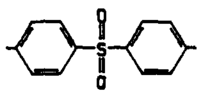
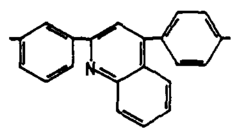
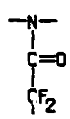
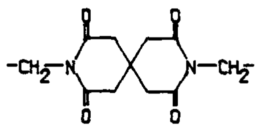
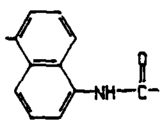
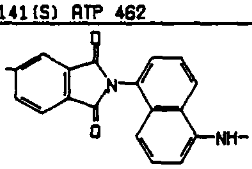
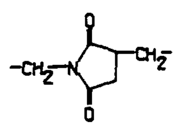
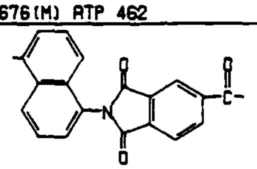
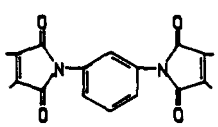
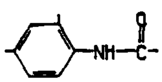
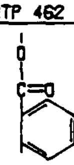
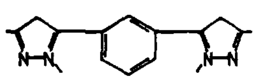
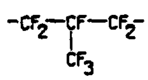
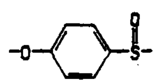
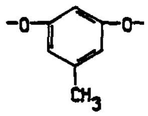
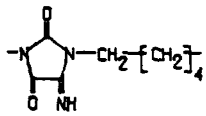
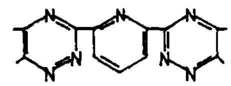
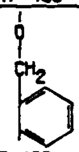
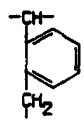
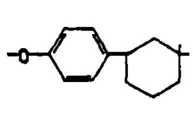
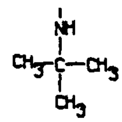
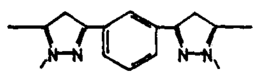
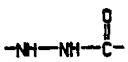
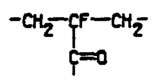
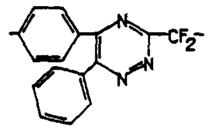
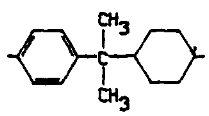
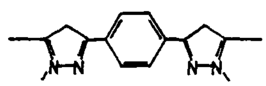
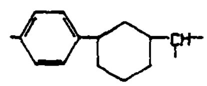
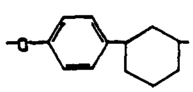
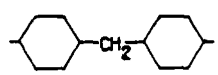
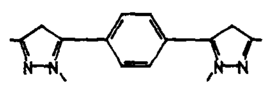
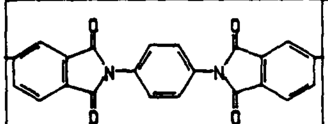
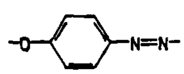
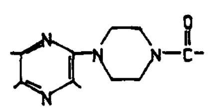
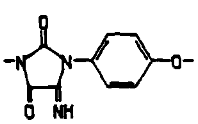
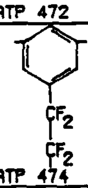
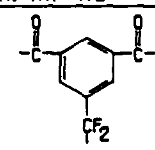
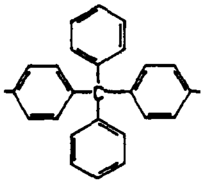
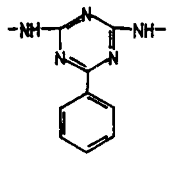
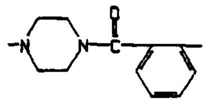
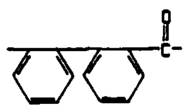
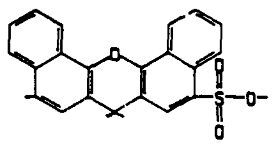
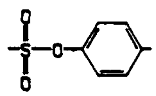
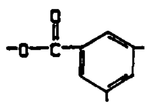
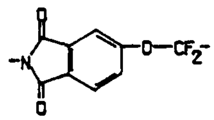
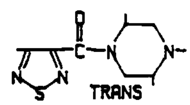
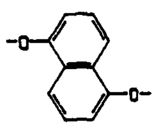
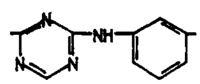
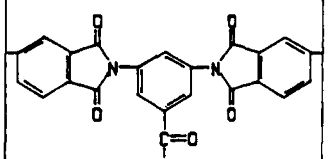
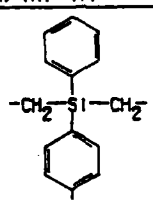
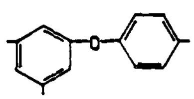
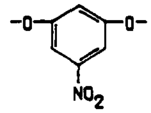
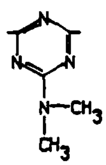
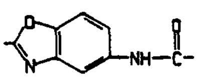
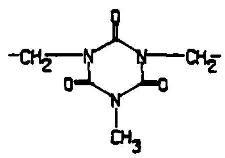
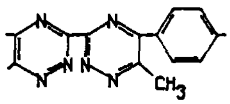
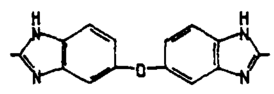
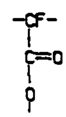
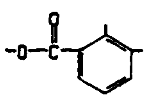
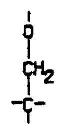
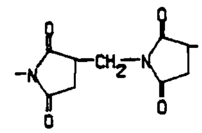
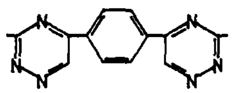
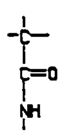
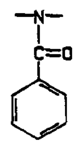
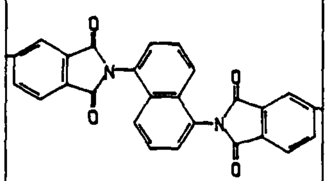
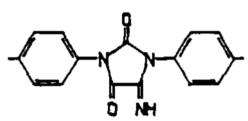
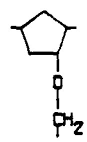
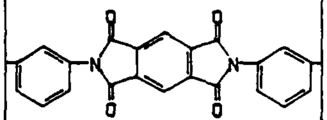
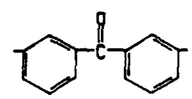
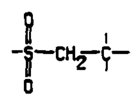
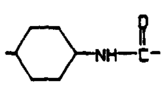
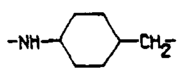
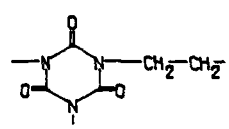
 756(M) ATP 447	 970(M) ATP 447	 2115(M) ATP 447
 2116(S) ATP 447	 952(M) ATP 448	 1995(M) ATP 448
 2188(M) ATP 448	 563(M) ATP 449	 1120(M) ATP 449
 1121(M) ATP 449	 1857(M) ATP 450	 642(M) ATP 451
 678(M) ATP 451	 242(M) ATP 452	 1205(M) ATP 452
 1208(M) ATP 452	 1929(M) ATP 452	 1930(M) ATP 452
 840(M) ATP 453	 1535(M) ATP 453	 1730(M) ATP 453

 2149(M) ATP 453	 349(S) ATP 454
 1161(M) ATP 454	 2205(M) ATP 454
 2206(M) ATP 454	 255(S) ATP 455
 1645(M) ATP 455	 197(M) ATP 456
 1849(M) ATP 456	 965(M) ATP 457
 1573(M) ATP 457	 1871(M) ATP 457
 1872(M) ATP 457	 2174(M) ATP 457
 616(S) ATP 458	 807(M) ATP 458

 860(M) ATP 458	 991(M) ATP 458	 1119(M) ATP 458
 1190(M) ATP 458	 1811(M) ATP 458	 1919(M) ATP 458
 1998(M) ATP 458	 2182(M) ATP 458	 623(S) ATP 459
 2190(M) ATP 459	 667(M) ATP 460	 1634(M) ATP 460
 1141(S) ATP 462	 1600(M) ATP 462	 1676(M) ATP 462
 1677(M) ATP 462	 1992(M) ATP 462	 2123(M) ATP 462
 2137(M) ATP 462	 1921(M) ATP 463	 1001(S) ATP 464
 2086(M) ATP 464	 792(M) ATP 465	 1107(M) ATP 465

 1154(M) ATP 465	 1988(M) ATP 465	 2199(M) ATP 465
 420(S) ATP 466	 631(S) ATP 466	 664(S) ATP 466
 665(M) ATP 466	 696(S) ATP 466	 2084(M) ATP 466
 1229(M) ATP 467	 817(M) ATP 468	 1851(M) ATP 468
 657(M) ATP 469	 2085(M) ATP 469	 1116(M) ATP 470
 1117(M) ATP 470	 1207(M) ATP 470	 2087(M) ATP 471
 2198(M) ATP 471	 1109(M) ATP 472	 1250(M) ATP 472
 1985(M) ATP 472	 1012(S) ATP 474	 1072(M) ATP 474

 1114(M) ATP 475	 1693(M) ATP 475	 1945(M) ATP 475
 1946(M) ATP 475	 2018(M) ATP 475	 2019(M) ATP 475
 733(M) ATP 476	 2024(M) ATP 476	 1259(M) ATP 477
 1268(M) ATP 477	 1694(M) ATP 477	 2196(M) ATP 477
 607(M) ATP 478	 1098(M) ATP 478	 1099(M) ATP 478
 1692(S) ATP 479	 1187(M) ATP 480	 1915(M) ATP 481

 2128(M) ATP 481	 2191(M) ATP 481	 193(S) ATP 482
 430(M) ATP 482	 1068(S) ATP 482	 1994(M) ATP 482
 2131(M) ATP 482	 844(S) ATP 483	 1137(S) ATP 483
 2194(M) ATP 483	 1986(M) ATP 484	 681(S) ATP 485
 1502(M) ATP 487	 1504(M) ATP 487	 2046(M) ATP 487
 1230(M) ATP 488	 1231(M) ATP 488	 1912(M) ATP 489

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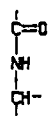
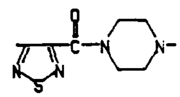
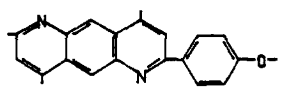
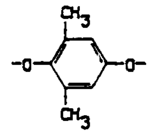
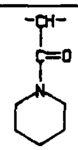
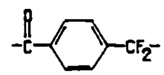
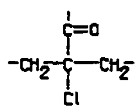
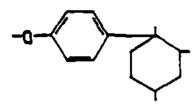
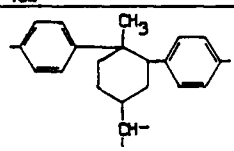
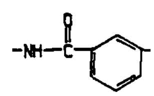
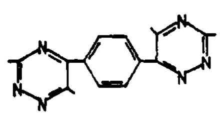
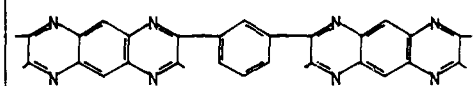
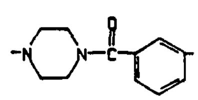
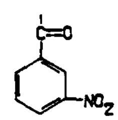
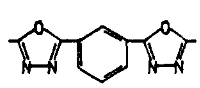
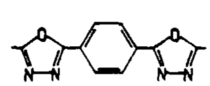
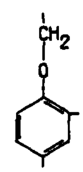
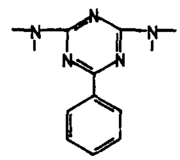
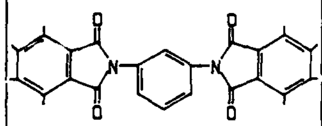
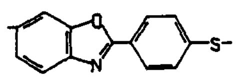
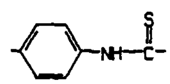
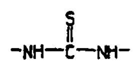
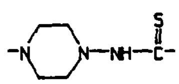
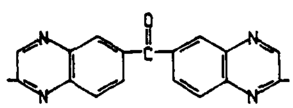
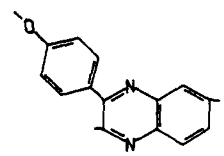
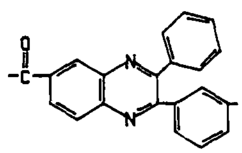
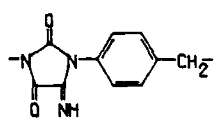
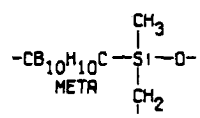
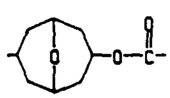
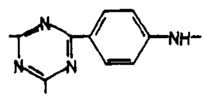
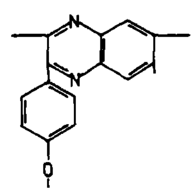
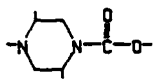
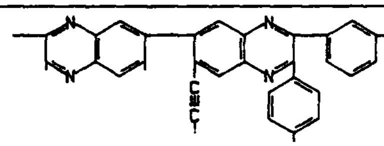
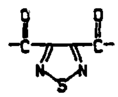
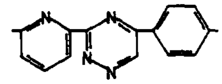
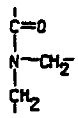
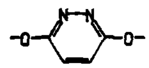
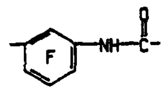
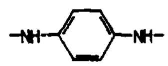
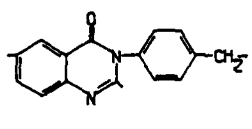
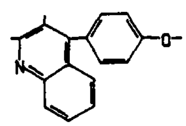
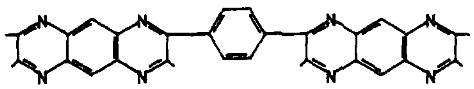
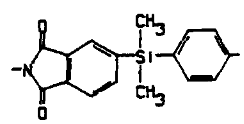
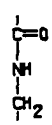
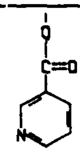
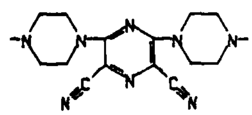
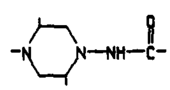
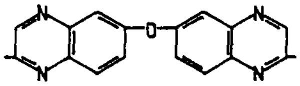
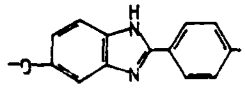
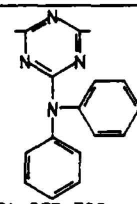
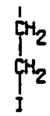
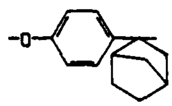
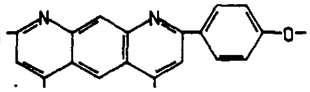
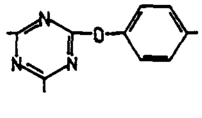
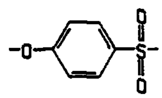
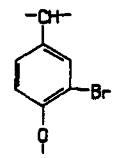
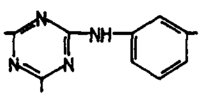
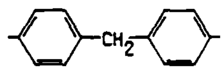
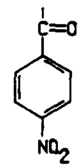
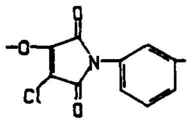
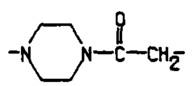
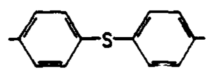
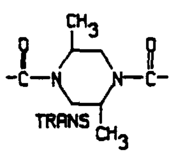
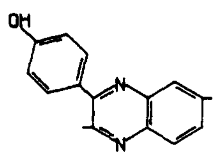
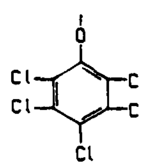
 396(S) ATP 490	 1249(M) ATP 490
 1282(M) ATP 490	 2117(M) ATP 490
 410(S) ATP 491	 996(M) ATP 491
 330(M) ATP 492	 668(M) ATP 492
 953(M) ATP 492	 1019(M) ATP 492
 2173(M) ATP 492	 1272(M) ATP 493
 1949(M) ATP 493	 1025(S) ATP 493
 1200(M) ATP 494	 1202(M) ATP 494

 1174(S) ATP 495	 1859(M) ATP 495	 2078(M) ATP 495
 1196(M) ATP 496	 1950(M) ATP 496	 2048(M) ATP 496
 2052(M) ATP 496	 2152(M) ATP 496	 1542(S) ATP 497
 1580(M) ATP 497	 1987(M) ATP 497	 969(M) ATP 499
 1947(M) ATP 499	 1804(M) ATP 500	 1558(S) ATP 501

 1933(M) ATP 501	 2148(M) ATP 501
 1226(M) ATP 502	 1867(M) ATP 502
 400(S) ATP 503	 1094(M) ATP 503
 1153(M) ATP 503	 1236(M) ATP 503
 1295(M) ATP 503	 1623(M) ATP 504
 1274(M) ATP 505	 1721(M) ATP 505
 393(S) ATP 506	 910(S) ATP 506
 1251(M) ATP 506	 1939(M) ATP 506

 2185(M) ATP 506	 1648(M) ATP 508	 1671(S) ATP 508
 748(S) ATP 509	 1118(M) ATP 510	 1283(M) ATP 510
 1813(M) ATP 510	 666(M) ATP 511	 1172(S) ATP 511
 1690(M) ATP 511	 96(M) ATP 512	 1027(S) ATP 512
 2008(M) ATP 512	 437(M) ATP 513	 641(M) ATP 513
 1258(M) ATP 513	 1553(S) ATP 513	 1057(S) ATP 514

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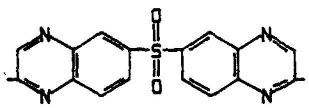
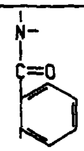
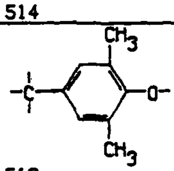
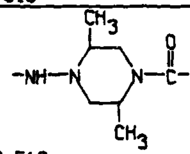
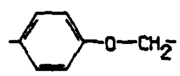
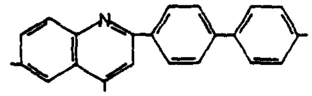
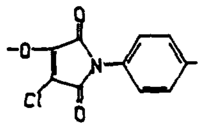
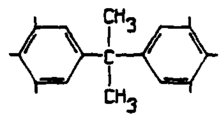
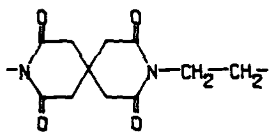
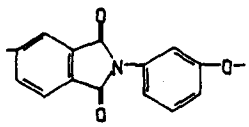
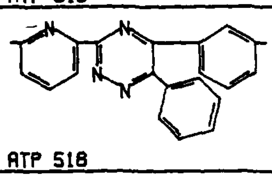
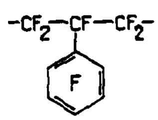
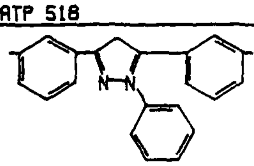
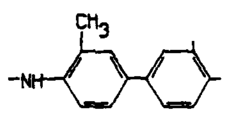
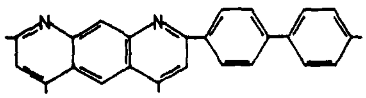
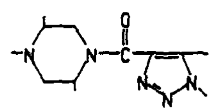
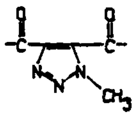
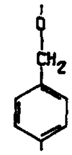
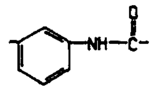
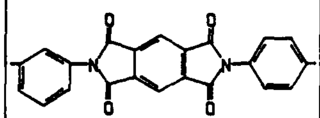
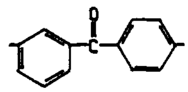
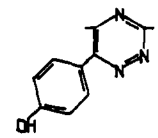
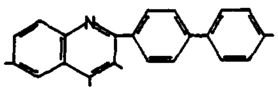
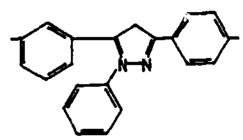
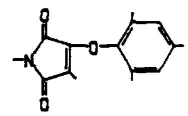
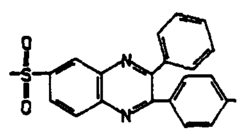
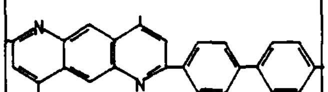
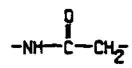
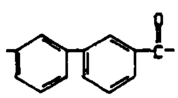
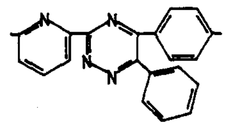
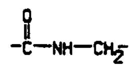
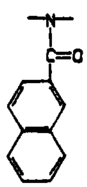
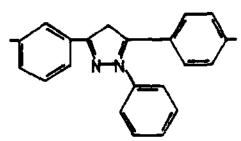
 2186(M) ATP 514	 296(S) ATP 516
 1096(M) ATP 516	 1936(M) ATP 516
 97(M) ATP 517	 1617(M) ATP 517
 1999(M) ATP 517	 2089(M) ATP 517
 1601(M) ATP 518	 1727(M) ATP 518
 1860(M) ATP 518	 195(M) ATP 519
 1973(M) ATP 520	 2133(M) ATP 520
 1281(M) ATP 523	 1927(M) ATP 524

 1928(M) ATP 524	 206(S) ATP 525	 1062(M) ATP 526
 1505(M) ATP 526	 1506(M) ATP 526	 1831(S) ATP 526
 1608(M) ATP 527	 1977(M) ATP 527	 2202(M) ATP 528
 1586(M) ATP 529	 1279(M) ATP 530	 15(M) ATP 531
 799(M) ATP 531	 1863(M) ATP 531	 11(M) ATP 533
 1139(S) ATP 533	 1978(M) ATP 533	 189(S) ATP 534

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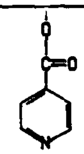
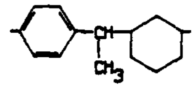
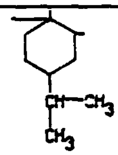
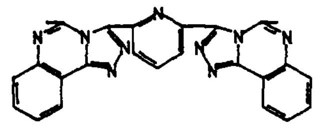
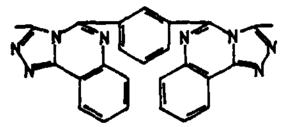
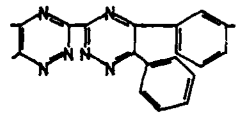
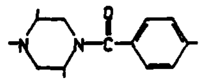
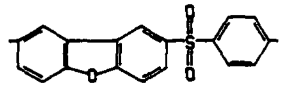
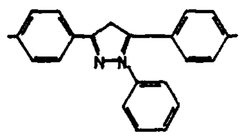
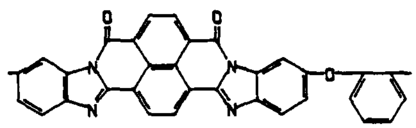
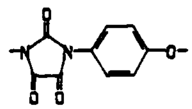
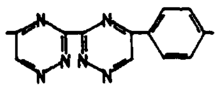
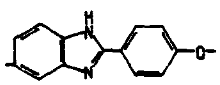
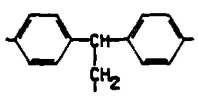
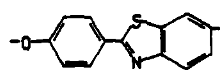
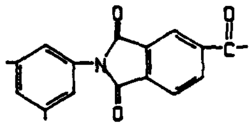
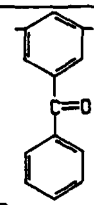
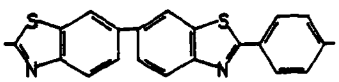
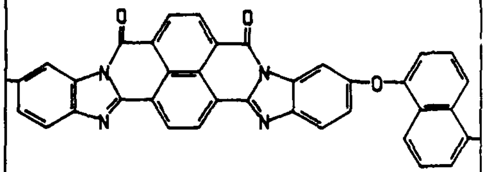
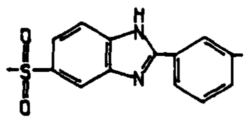
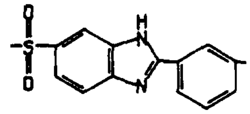
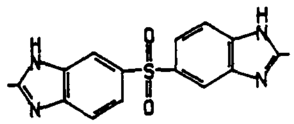
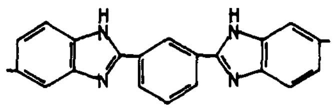
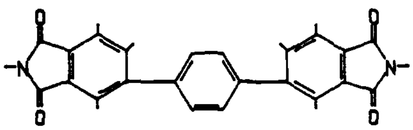
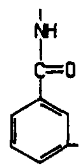
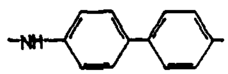
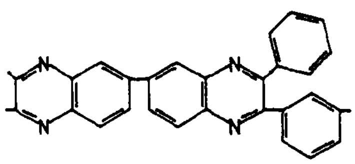
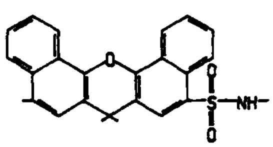
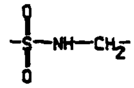
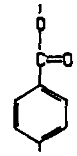
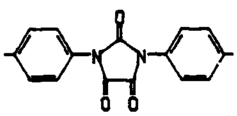
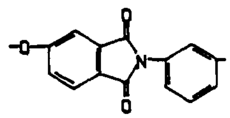
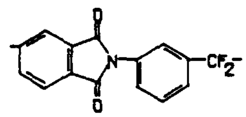
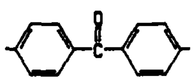
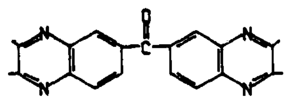
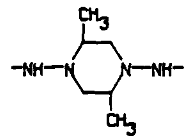
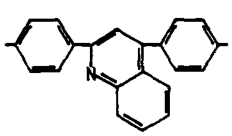
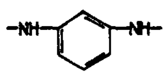
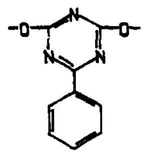
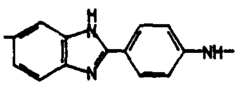
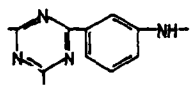
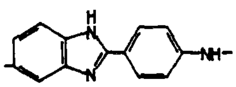
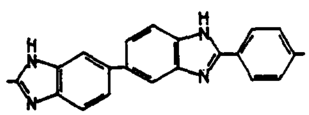
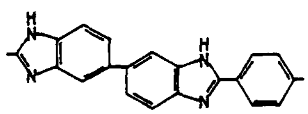
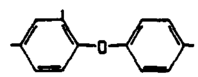
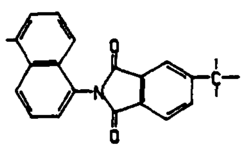
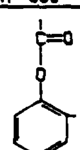
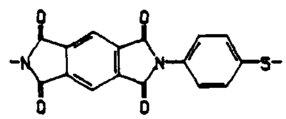
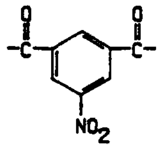
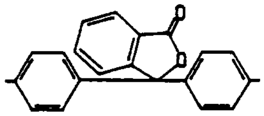
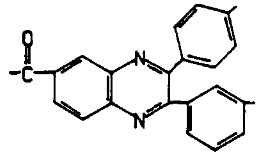
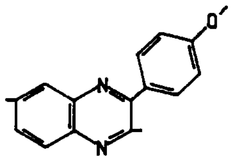
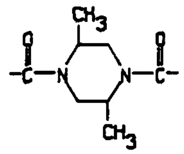
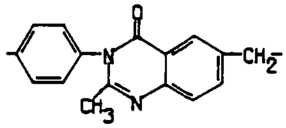
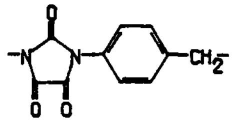
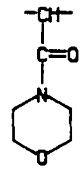
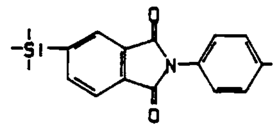
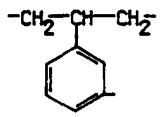
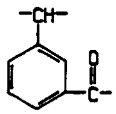
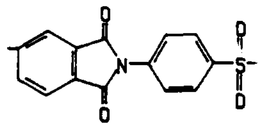
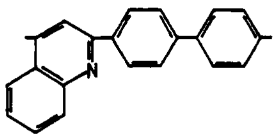
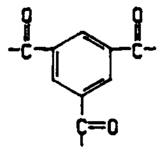
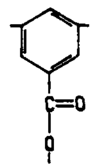
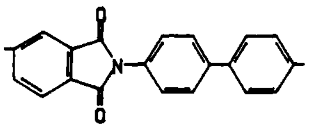
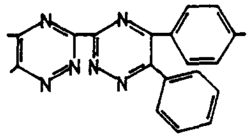
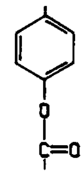
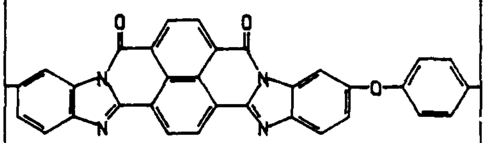
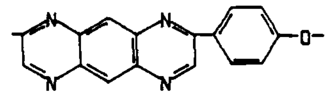
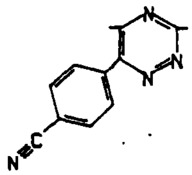
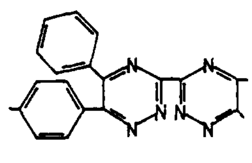
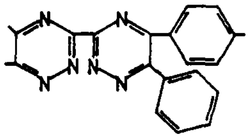
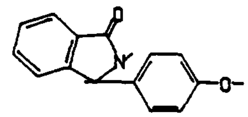
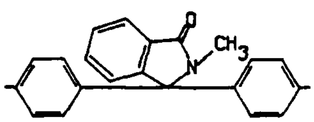
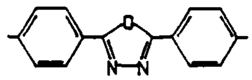
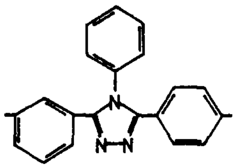
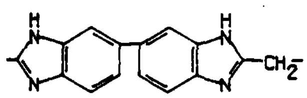
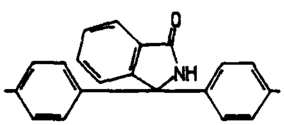
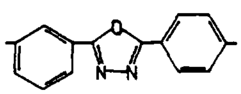
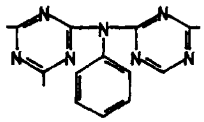
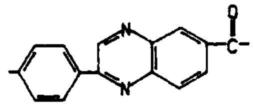
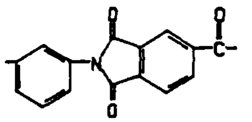
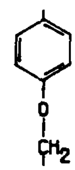
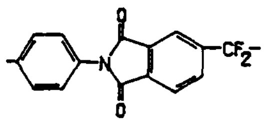
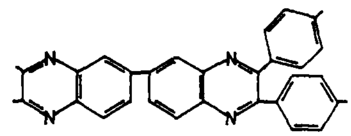
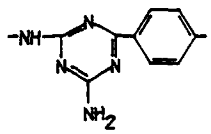
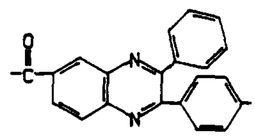
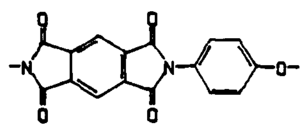
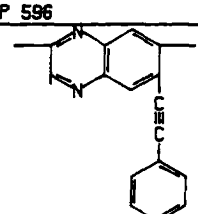
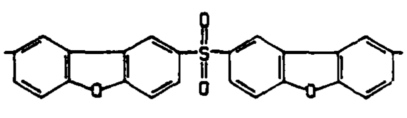
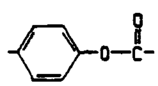
 986(S) ATP 535	 1115(M) ATP 535
 671(S) ATP 536	 2148(M) ATP 536
 2207(M) ATP 536	 2167(M) ATP 537
 1940(M) ATP 538	 2049(M) ATP 538
 1976(M) ATP 540	 1265(M) ATP 541
 1288(M) ATP 541	 1981(M) ATP 541
 2130(M) ATP 541	 1644(M) ATP 544
 843(M) ATP 547	 1225(M) ATP 548

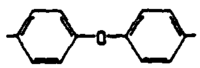
 1681(M) ATP 548	 1683(S) ATP 548
 2143(M) ATP 548	 1267(M) ATP 549
 1650(M) ATP 549	 2175(M) ATP 549
 2176(M) ATP 549	 2178(M) ATP 549
 2192(M) ATP 550	 1175(S) ATP 551
 1678(M) ATP 551	 2166(M) ATP 551

 2021(M) ATP 552	 2022(M) ATP 552	 175(S) ATP 554
 1980(M) ATP 554	 1753(M) ATP 555	 2041(M) ATP 555
 1101(M) ATP 556	 2063(M) ATP 556	 1938(M) ATP 557
 1628(M) ATP 558	 1234(M) ATP 559	 1845(M) ATP 559
 1670(M) ATP 560	 1801(M) ATP 560	 2098(M) ATP 560
 2208(M) ATP 560	 2209(M) ATP 560	 2043(M) ATP 561
 1733(M) ATP 562	 6(S) ATP 563	 1523(M) ATP 563

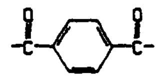
 1906(M) ATP 563	 730(M) ATP 565	 1540(M) ATP 565
 1544(S) ATP 565	 1916(M) ATP 565	 1293(M) ATP 566
 1979(M) ATP 566	 408(S) ATP 567	 1717(M) ATP 569
 904(M) ATP 571	 1171(S) ATP 571	 1703(M) ATP 571
 1633(M) ATP 575	 1581(M) ATP 576	 1582(S) ATP 576
 1679(M) ATP 577	 2126(M) ATP 578	 781(S) ATP 579

 1270(M) ATP 579	 1277(M) ATP 579
 1829(S) ATP 579	 2171(M) ATP 579
 2172(M) ATP 579	 721(M) ATP 580
 722(M) ATP 580	 1103(M) ATP 580
 1122(M) ATP 580	 2073(M) ATP 580
 737(M) ATP 581	 1201(M) ATP 583

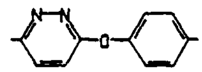
 1858(M) ATP 584	 1591(M) ATP 586
 1086(M) ATP 589	 698(S) ATP 590
 2040(M) ATP 590	 2150(M) ATP 591
 1803(M) ATP 595	 1578(M) ATP 596
 1513(M) ATP 597	 1559(S) ATP 597
 1878(M) ATP 597	 109(M) ATP 599



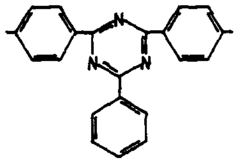
100(M) ATP 600



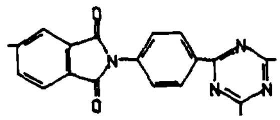
142(M) ATP 600



1093(M) ATP 600



1700(M) ATP 600



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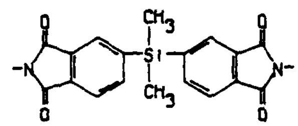
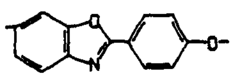
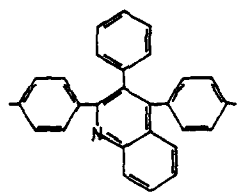


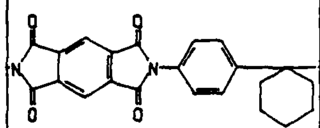
2193(M) ATP 600



1194(M) ATP 602



1621(M) ATP 602



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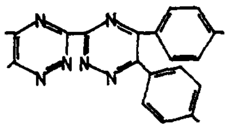

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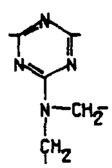

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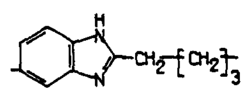

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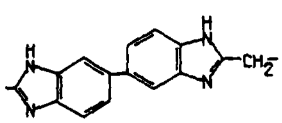
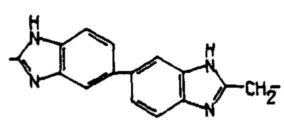
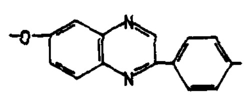


2210(M) ATP 606



2211(M) ATP 606



1594(M) ATP 607

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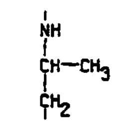
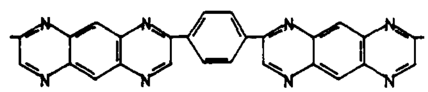
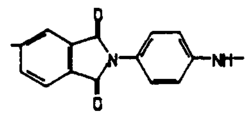
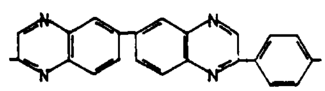

395(S) ATP 608


1276(M) ATP 608


1760(M) ATP 608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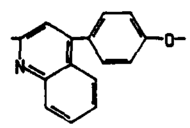
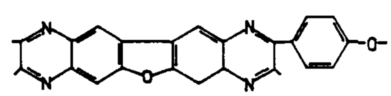
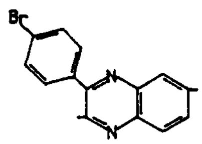

1630(M) ATP 613


1181(M) ATP 614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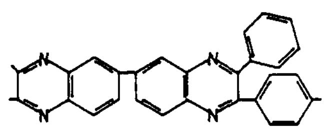
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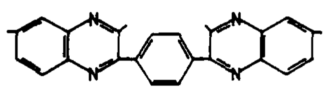
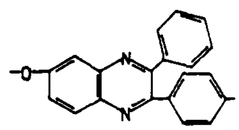

2068(M) ATP 616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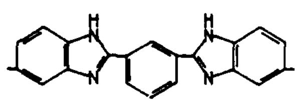
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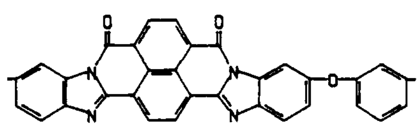
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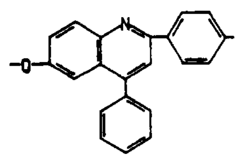
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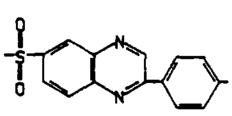
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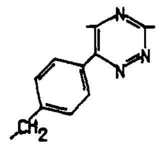
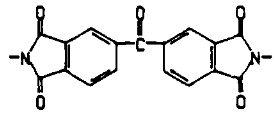
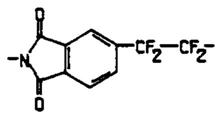
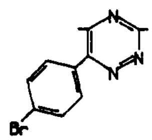
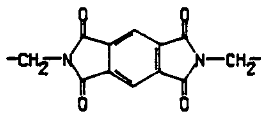
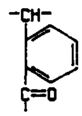
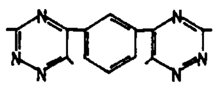
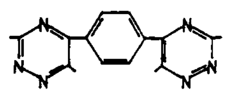
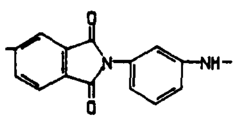
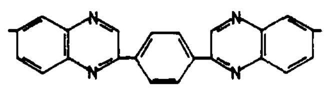
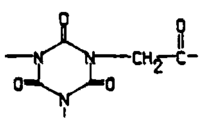
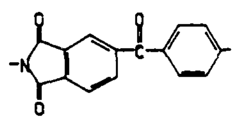
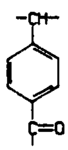
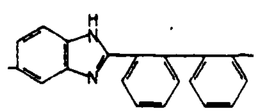
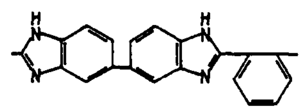
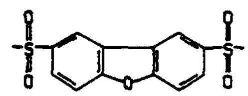
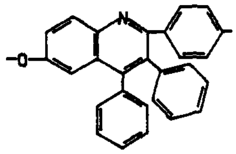
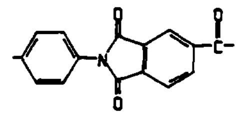
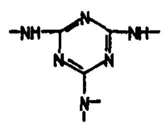
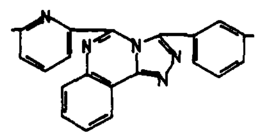
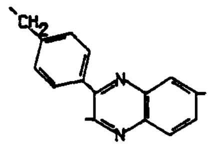
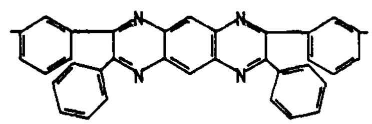
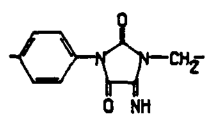
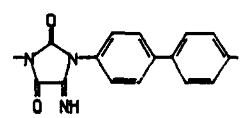
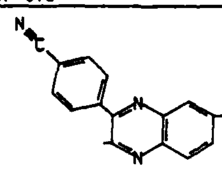
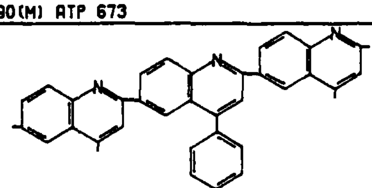
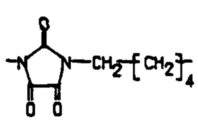
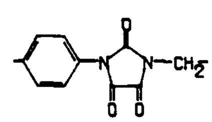
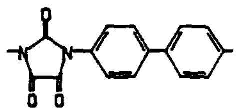
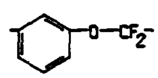
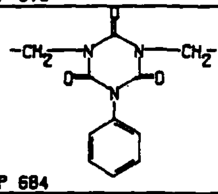
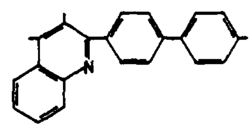
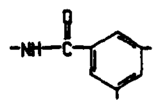
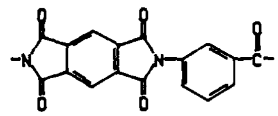
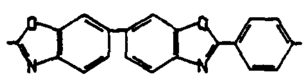
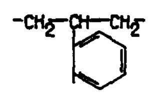
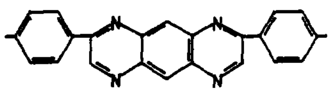
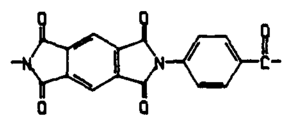
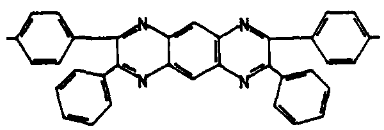
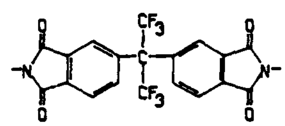
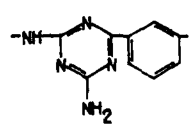
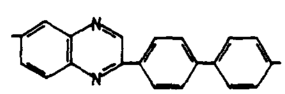
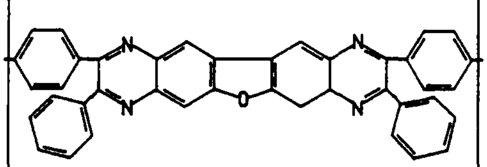
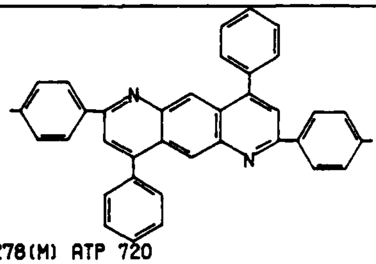
 1827(S) ATP 627	 1085(M) ATP 628
 1006(M) ATP 630	 1825(S) ATP 631
 1299(M) ATP 633	 272(S) ATP 635
 2080(M) ATP 635	 2081(M) ATP 637
 1691(M) ATP 642	 2062(M) ATP 645
 1874(M) ATP 647	 2075(M) ATP 649
 980(S) ATP 651	 1780(M) ATP 659

 2165(M) ATP 659	 1879(M) ATP 663
 1604(M) ATP 664	 1084(M) ATP 665
 1661(M) ATP 665	 1287(M) ATP 666
 1549(S) ATP 668	 1271(M) ATP 669
 1989(M) ATP 673	 1990(M) ATP 673
 1551(S) ATP 675	 1612(M) ATP 676
 1982(M) ATP 678	 1983(M) ATP 678

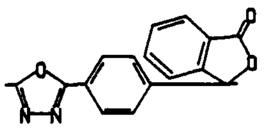
 1984(M) ATP 678	 1726(M) ATP 684
 1873(M) ATP 684	 1626(M) ATP 685
 1016(M) ATP 690	 1503(M) ATP 690
 2060(M) ATP 693	 373(M) ATP 695
 1275(M) ATP 695	 1507(M) ATP 695
 1273(M) ATP 705	 2074(M) ATP 713
 1800(M) ATP 714	 1527(M) ATP 717



1180(M) ATP 719



1278(M) ATP 720



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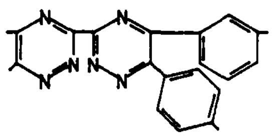

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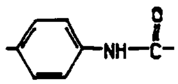

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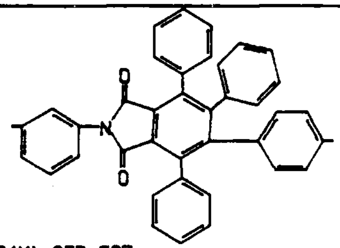
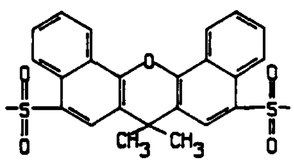


1766(M) ATP 727



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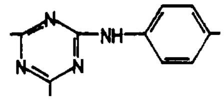
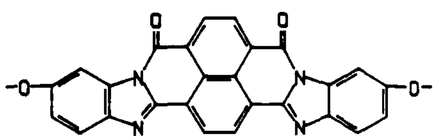
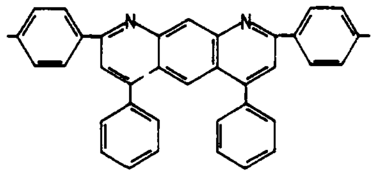


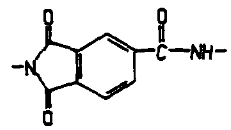
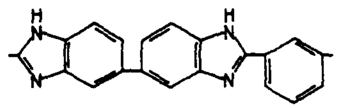
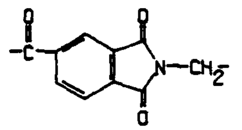
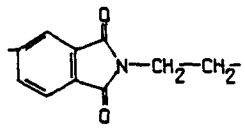
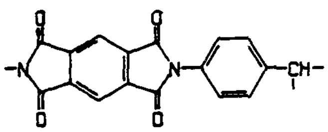
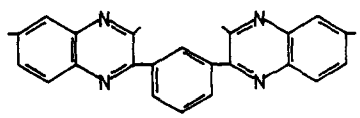
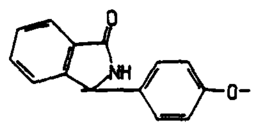
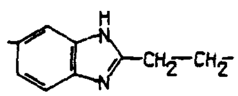
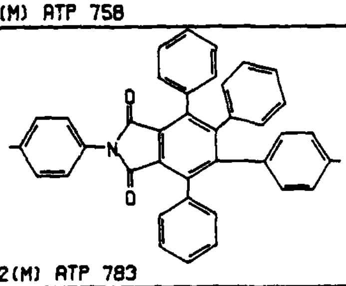
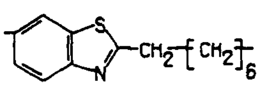
1669(M) ATP 736



1264(M) ATP 739



1280(M) ATP 739

 1702(M) ATP 740	 2168(M) ATP 740
 1708(M) ATP 741	 1714(M) ATP 741
 1501(M) ATP 753	 2066(M) ATP 755
 738(M) ATP 758	 1673(M) ATP 781
 1772(M) ATP 783	 2093(M) ATP 787

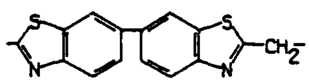
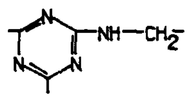
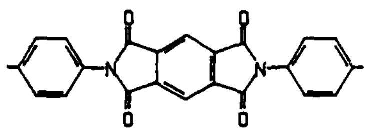
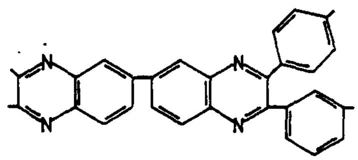
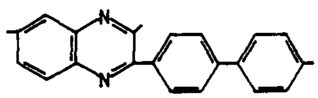
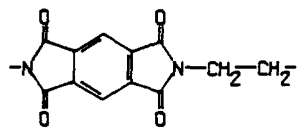
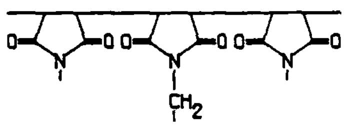
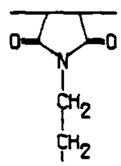
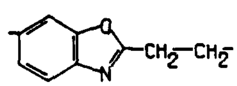
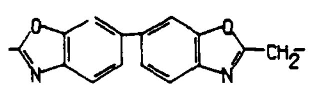
 2144(M) ATP 787	 1660(M) ATP 806
 1500(M) ATP 823	 2065(M) ATP 825
 1565(M) ATP 837	 1298(M) ATP 861
 1781(M) ATP 865	 1783(S) ATP 891
 1197(M) ATP 1043	 2139(M) ATP 1043

Table 4

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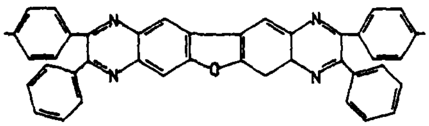
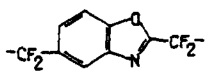
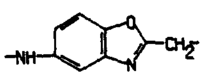
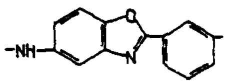
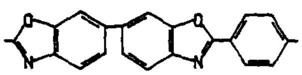
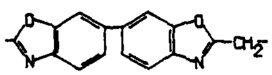
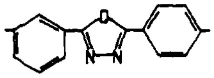
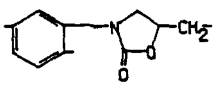
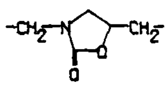
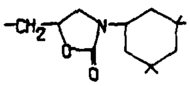
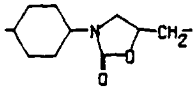
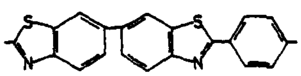
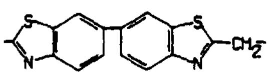
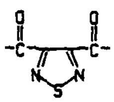
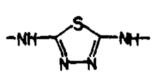
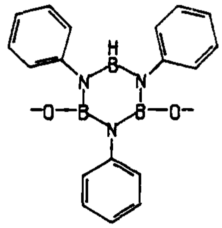
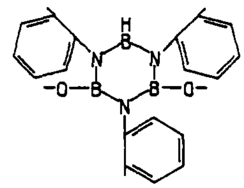
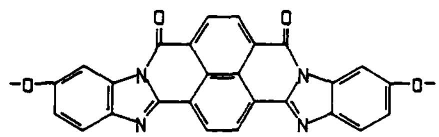
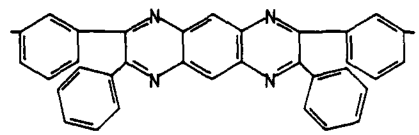
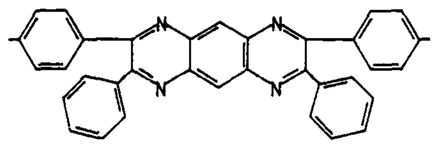
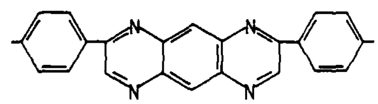
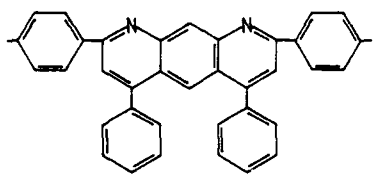
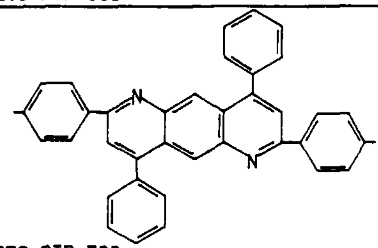
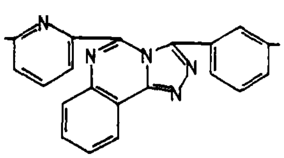
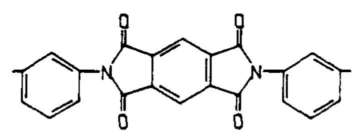
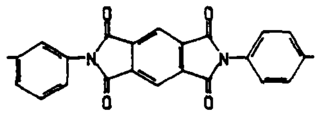
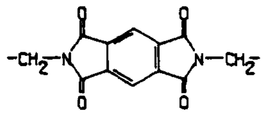
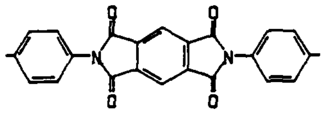
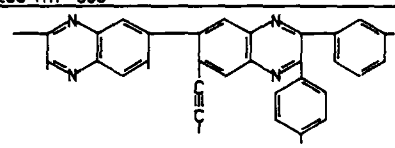
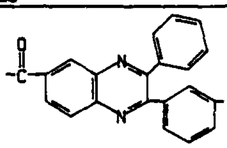
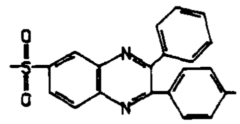
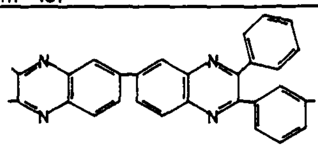
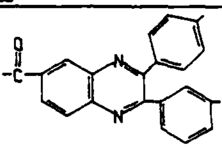
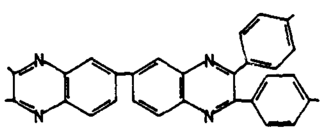
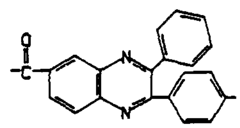
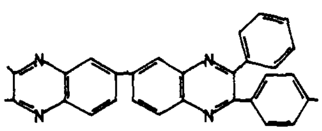
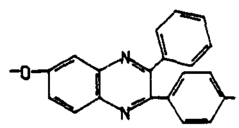
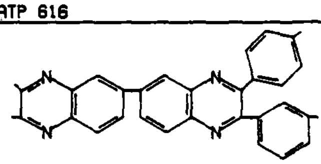
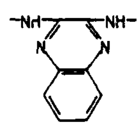
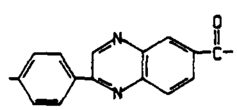
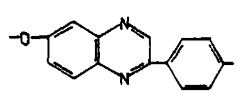
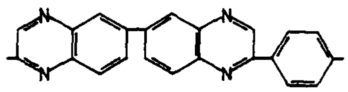
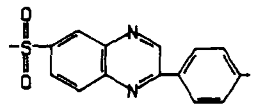
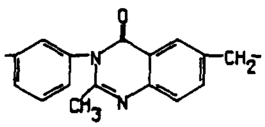
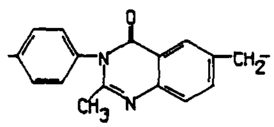
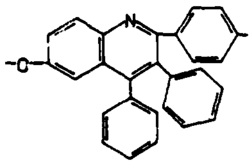
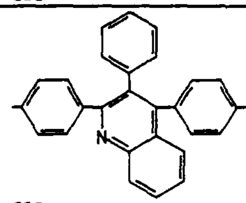
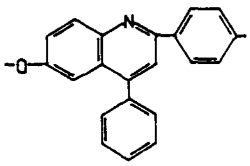
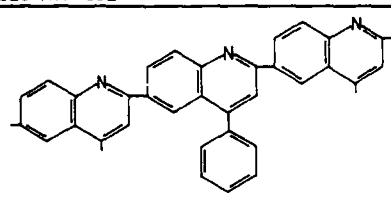
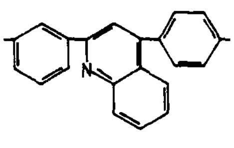
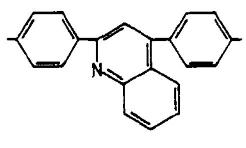
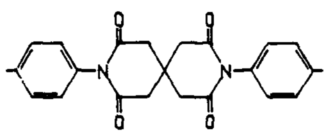
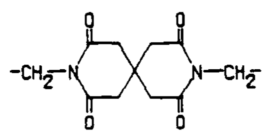
 1180 ATP 719	 791 ATP 359
 1185 ATP 428	 1190 ATP 458
 2080 ATP 693	 2139 ATP 1043
 1103 ATP 580	 1201 ATP 583
 1215 ATP 350	 1211 ATP 360
 1218 ATP 417	 1205 ATP 452
 2143 ATP 548	 2144 ATP 787
 1226 ATP 502	 1238 ATP 409

 1263 ATP 344	 1260 ATP 406
 1264 ATP 739	 1271 ATP 669
 1273 ATP 705	 1275 ATP 695
 1280 ATP 739	 1278 ATP 720
 1287 ATP 666	 1502 ATP 487

 1505 ATP 526	 1299 ATP 633
 1500 ATP 823	 2148 ATP 501
 1580 ATP 497	 1586 ATP 529
 2166 ATP 551	 1540 ATP 565
 2150 ATP 591	 1578 ATP 596
 2067 ATP 616	 1583 ATP 617
 2065 ATP 825	 1592 ATP 400
 1591 ATP 586	 1594 ATP 607

 2061 ATP 609	 1597 ATP 624
 1290 ATP 396	 1293 ATP 566
 1604 ATP 664	 1621 ATP 602
 1613 ATP 621	 1612 ATP 676
 1634 ATP 460	 1628 ATP 558
 1602 ATP 412	 1600 ATP 462

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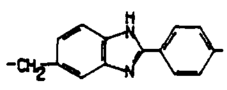
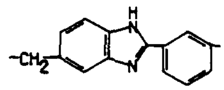
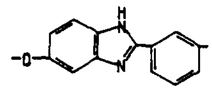
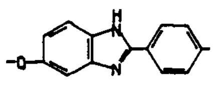
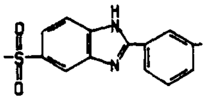
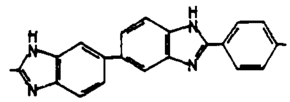
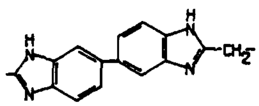
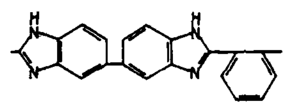
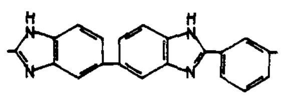
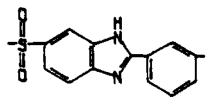
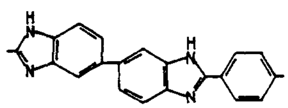
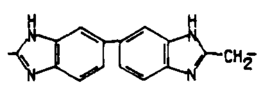
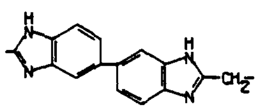
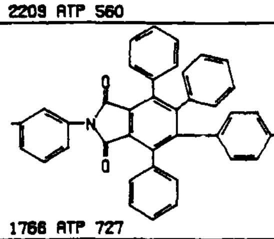
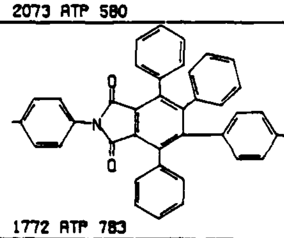
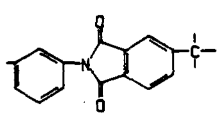
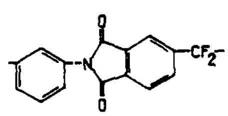
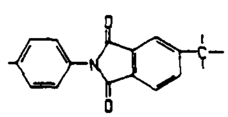
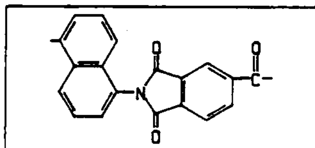
 1642 ATP 441	 1639 ATP 445	 1645 ATP 455
 1648 ATP 508	 1650 ATP 549	 2208 ATP 560
 2210 ATP 606	 2165 ATP 659	 2168 ATP 740
 2175 ATP 549	 2209 ATP 560	 2073 ATP 580
 2211 ATP 606	 1768 ATP 727	 1772 ATP 783
 1736 ATP 407	 1725 ATP 445	 1730 ATP 453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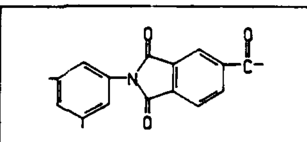
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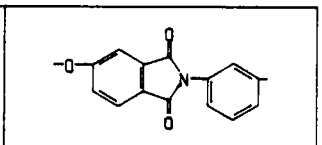
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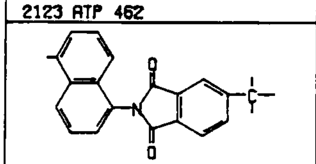
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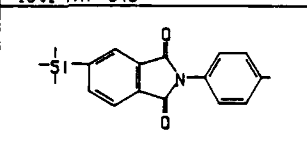
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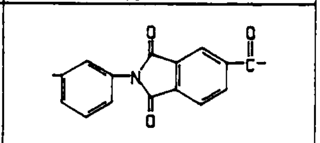
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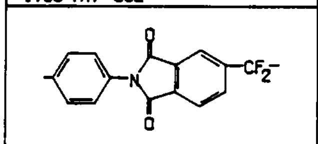
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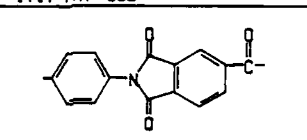
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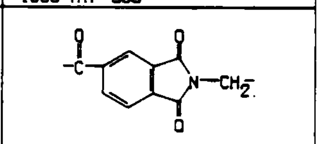
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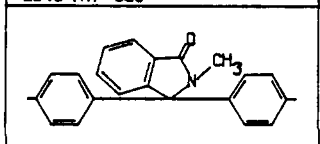
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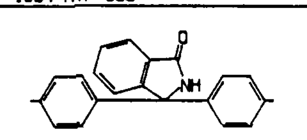
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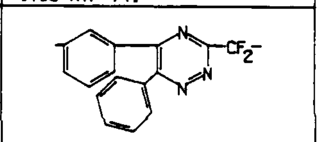
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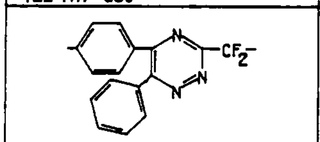
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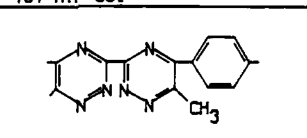
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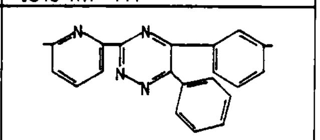
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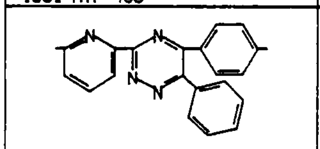
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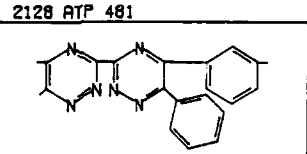
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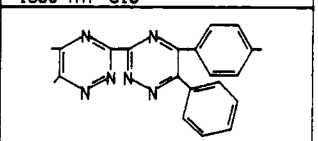
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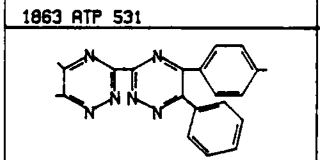
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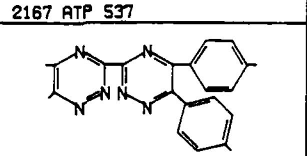
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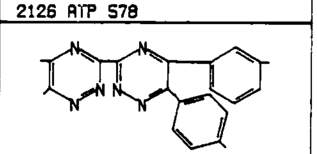
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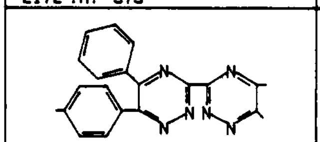
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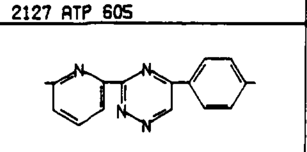
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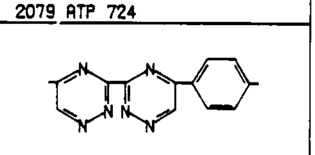
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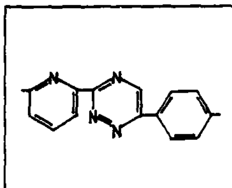
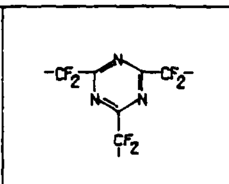
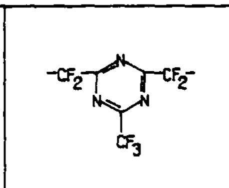
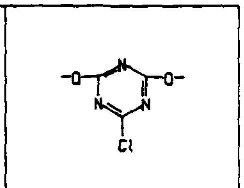
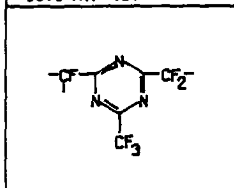
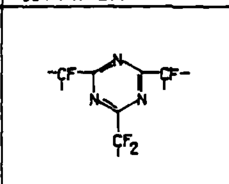
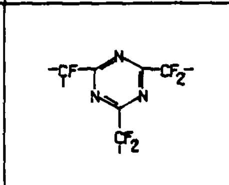
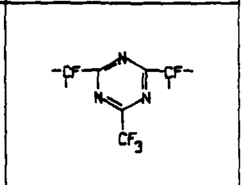
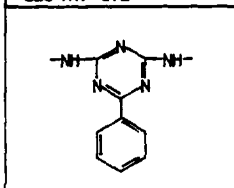
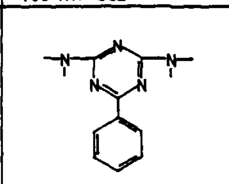
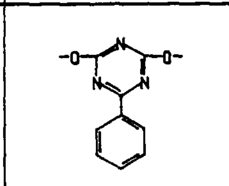
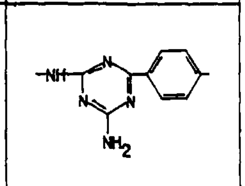
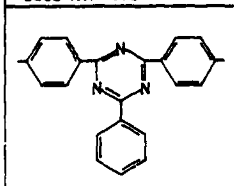
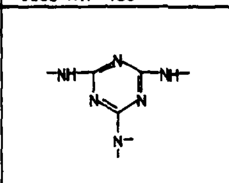
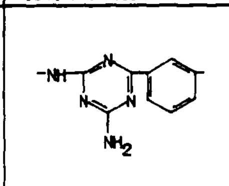
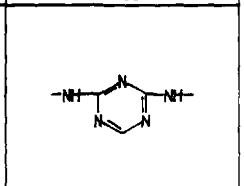
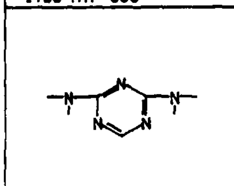
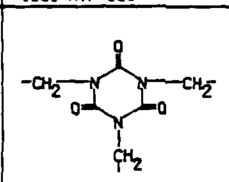
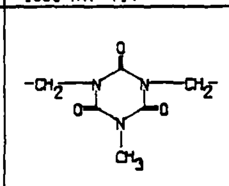
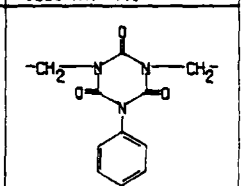
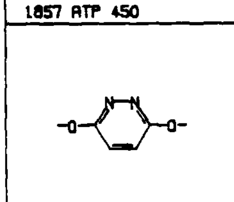
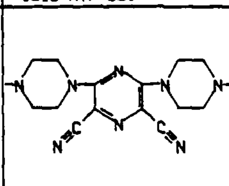
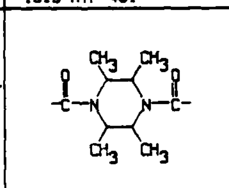
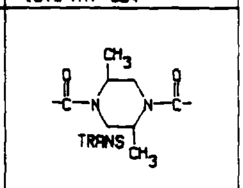
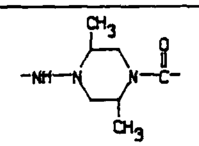
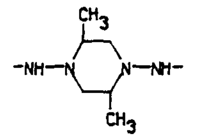
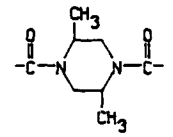
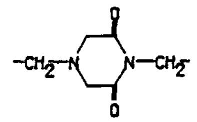
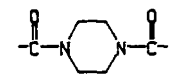
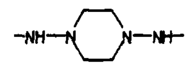
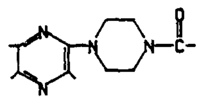
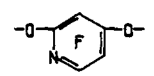
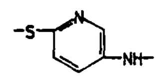
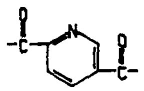
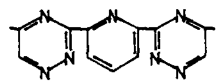
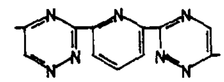
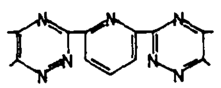
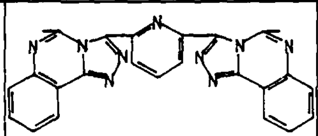
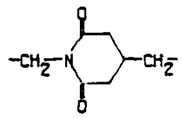
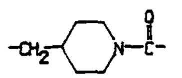
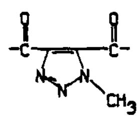
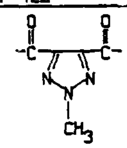
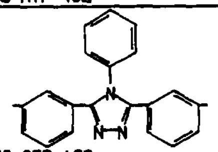
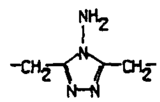
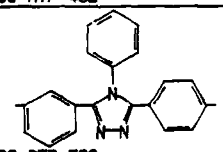
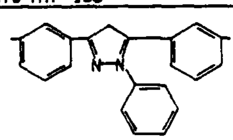
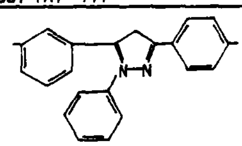
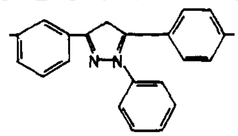
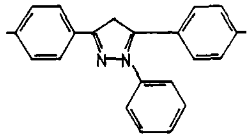
 1871 ATP 457	 594 ATP 277	 595 ATP 305	 1812 ATP 371
 528 ATP 372	 711 ATP 392	 725 ATP 393	 724 ATP 403
 1683 ATP 475	 1859 ATP 495	 1845 ATP 559	 1803 ATP 595
 1700 ATP 600	 1661 ATP 665	 1800 ATP 714	 1695 ATP 441
 1857 ATP 450	 1913 ATP 391	 1915 ATP 481	 1873 ATP 684
 1094 ATP 503	 1251 ATP 506	 1956 ATP 356	 1258 ATP 513

 1936 ATP 516	 1938 ATP 557	 1916 ATP 565
 1942 ATP 300	 438 ATP 425	 1953 ATP 426
 1250 ATP 472	 144 ATP 325	 1962 ATP 69
 1958 ATP 404	 2200 ATP 428	 2174 ATP 457
 2199 ATP 465	 2146 ATP 536	 1966 ATP 422
 1255 ATP 402	 1928 ATP 524	 1930 ATP 452
 1970 ATP 168	 1967 ATP 444	 1122 ATP 580
 1973 ATP 520	 1977 ATP 527	 1978 ATP 533

TR 88044



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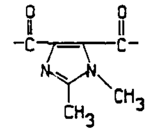

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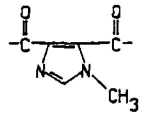

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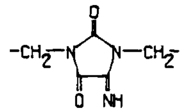

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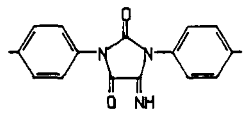

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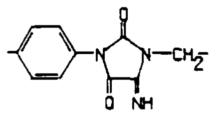

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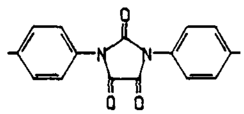

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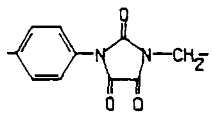

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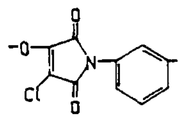

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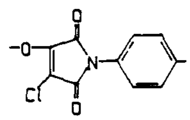

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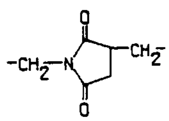

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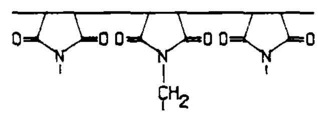

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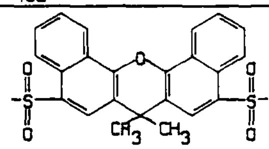

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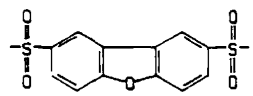

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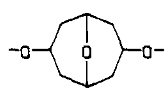

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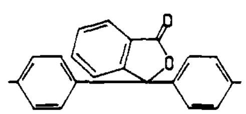

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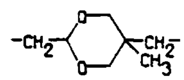
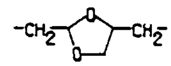
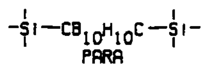
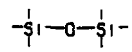
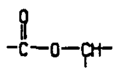
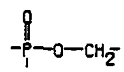
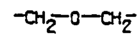
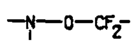
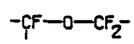
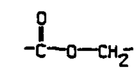
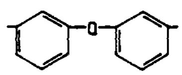
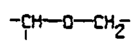
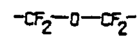
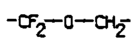
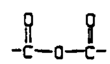
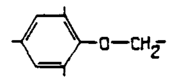
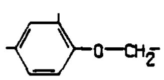
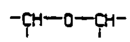
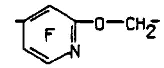
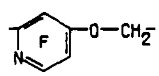
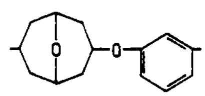
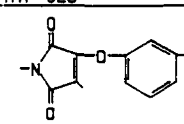
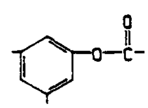
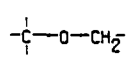
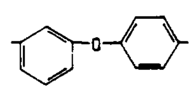
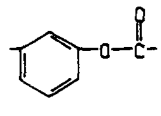
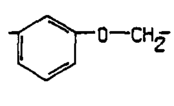
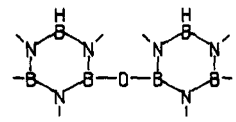
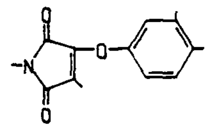
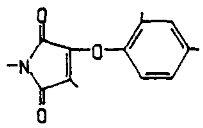
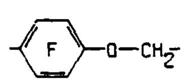
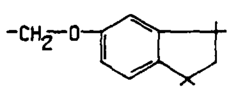
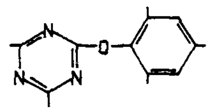
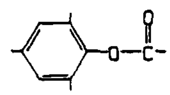
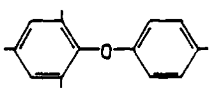
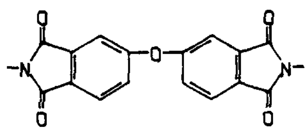
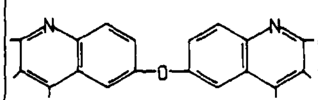
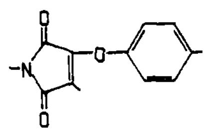
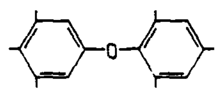
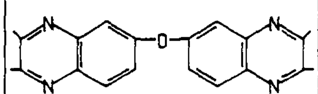
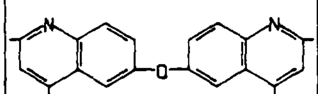
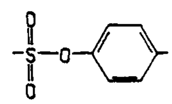
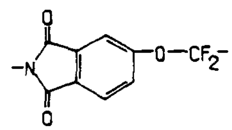
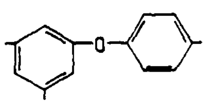
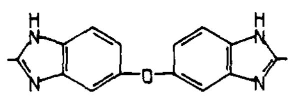
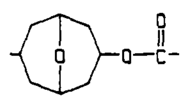
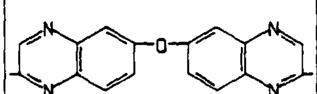
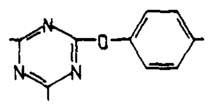
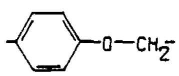
 658 ATP 275	 655 ATP 337	 1144 ATP 403
 2015 ATP 402	 675 ATP 355	 874 ATP -52
 1000 ATP 58	 975 ATP 132	 99 ATP 174
 982 ATP 177	 433 ATP 177	 103 ATP 193
 454 ATP 239	 707 ATP 244	 452 ATP 246
 159 ATP 248	 90 ATP 254	 1400 ATP 258
 1301 ATP 267	 930 ATP 309	 816 ATP 325
 141 ATP 325	 2016 ATP 343	 2011 ATP 346
 1008 ATP 346	 877 ATP 352	 1738 ATP 355

 801 ATP 357	 541 ATP 373	 1261 ATP 390
 2203 ATP 406	 2003 ATP 406	 205 ATP 411
 682 ATP 417	 1855 ATP 420	 1245 ATP 428
 2044 ATP 442	 1156 ATP 445	 2188 ATP 448
 1995 ATP 448	 2205 ATP 454	 2182 ATP 458
 2190 ATP 459	 2019 ATP 475	 2024 ATP 476
 1098 ATP 478	 2191 ATP 481	 1947 ATP 499
 2185 ATP 506	 1813 ATP 510	 97 ATP 517

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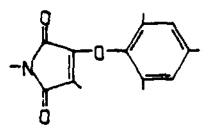
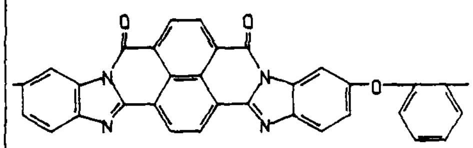
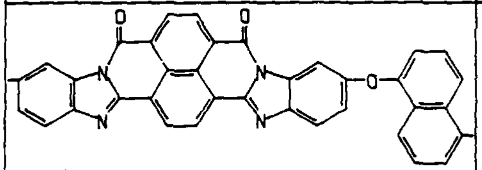
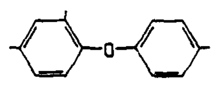
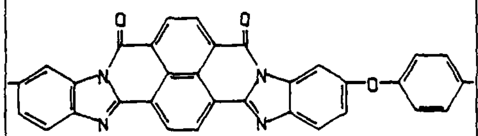
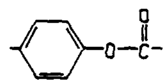
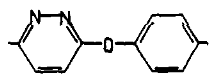
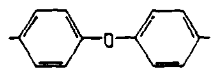
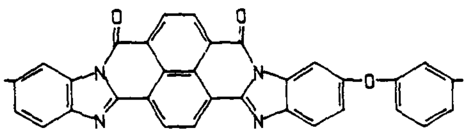
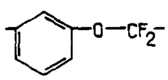
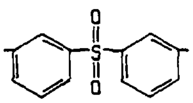
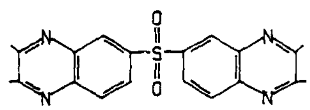
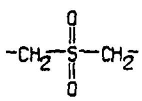
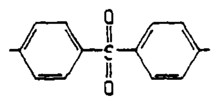
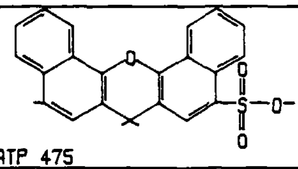
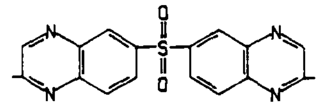
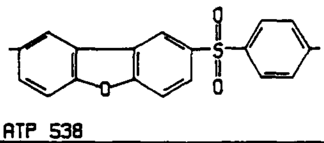
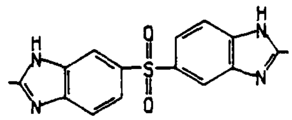
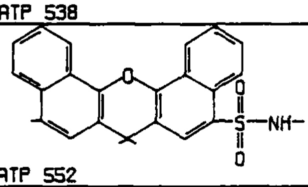
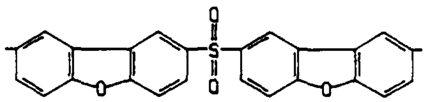
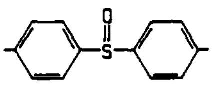
 2202 ATP 528	 1265 ATP 541
 1267 ATP 549	 2043 ATP 561
 1270 ATP 579	 109 ATP 599
 1093 ATP 600	 100 ATP 600
 1269 ATP 620	 1726 ATP 684
 1764 ATP 280	 2183 ATP 436
 2047 ATP 446	 667 ATP 460

 2018 ATP 475	 2186 ATP 514
 2049 ATP 538	 2176 ATP 549
 2021 ATP 552	 1878 ATP 597
 1108 ATP 435	$-\underset{\mid}{CH}-S-CH_2-$ 546 ATP 115
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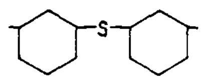
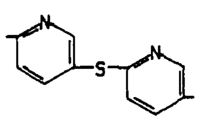
$-CH_2-S-CH_2-$ 295 ATP 210	 578 ATP 214
 2201 ATP 237	$-S-S-S-$ 545 ATP 246
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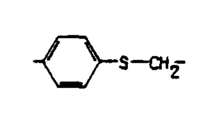
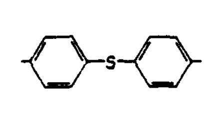
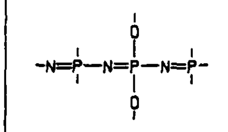
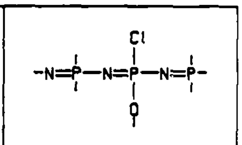
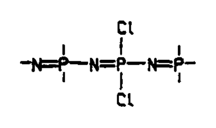
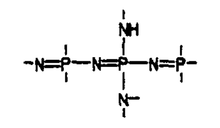
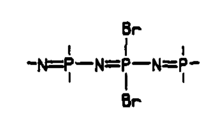
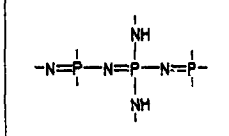
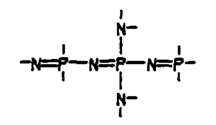
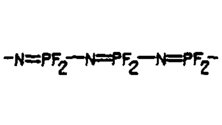
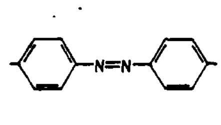
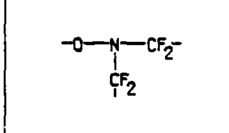
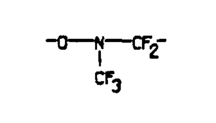
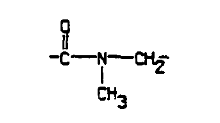
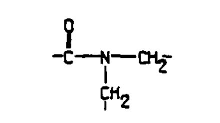
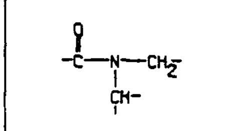
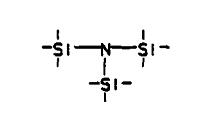
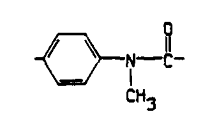
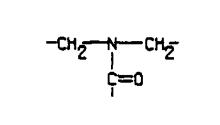
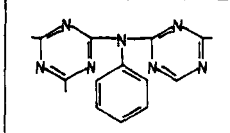
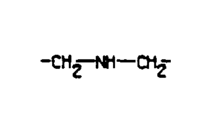
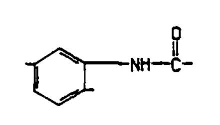
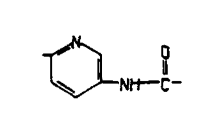
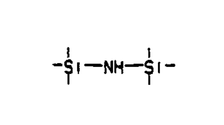
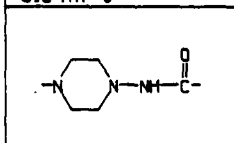
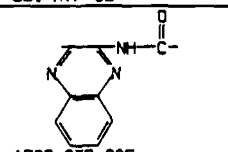
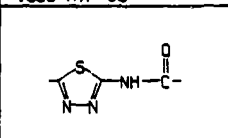
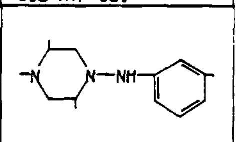
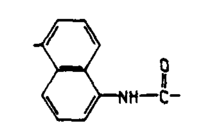
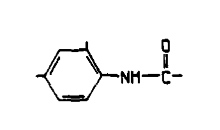
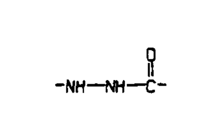
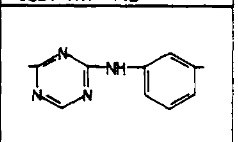
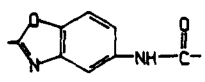
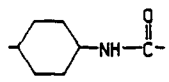
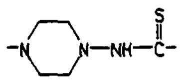
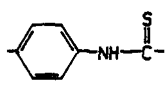
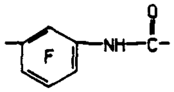
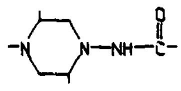
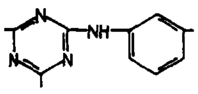
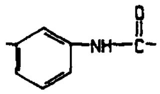
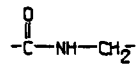
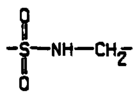
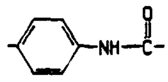
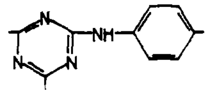
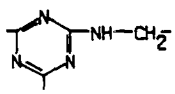
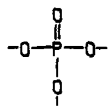
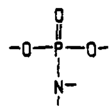
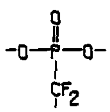
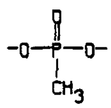
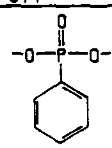
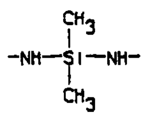
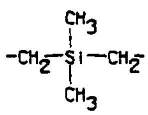
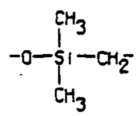
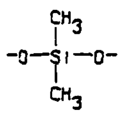
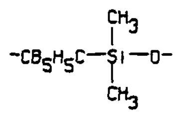
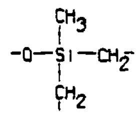
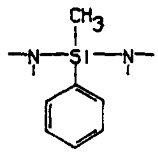
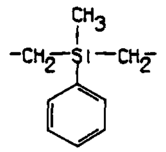
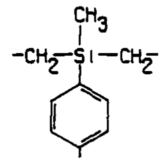
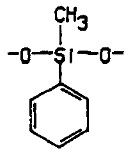
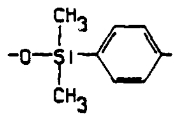
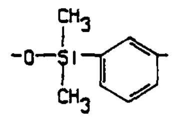
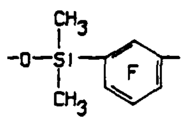
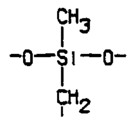
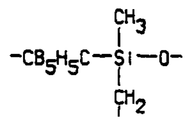
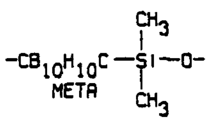
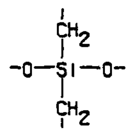
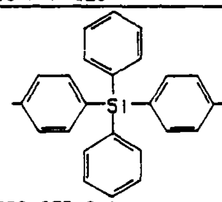
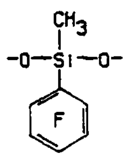
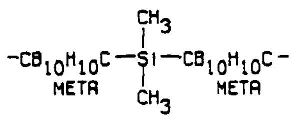
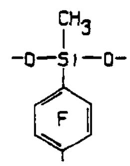
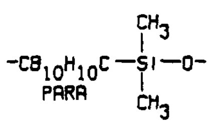
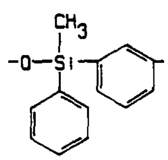
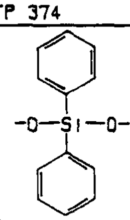
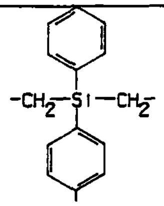
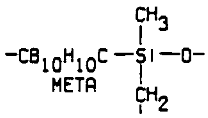
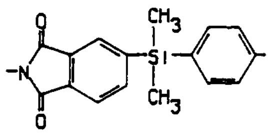
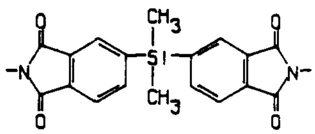
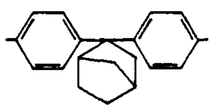
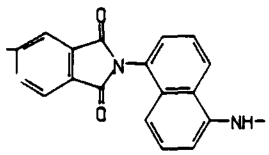
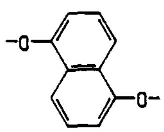
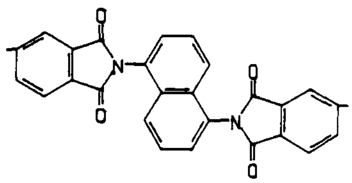
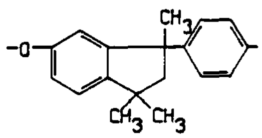
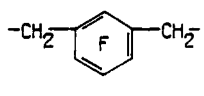
 101 ATP 432	 641 ATP 513	 162 ATP -72	 441 ATP 160
 637 ATP 205	 796 ATP 209	 824 ATP 259	 822 ATP 352
 644 ATP 378	 770 ATP 169	 1110 ATP 438	 981 ATP 237
 33 ATP 284	 706 ATP 301	 699 ATP 311	 1240 ATP 347
 610 ATP 350	 1242 ATP 387	 1134 ATP 431	 1858 ATP 584
 519 ATP 0	 561 ATP 52	 1963 ATP 69	 602 ATP 321
 1955 ATP 357	 1593 ATP 395	 1239 ATP 414	 1937 ATP 442
 1676 ATP 462	 1921 ATP 463	 1229 ATP 467	 1694 ATP 477

 1187 ATP 480	 1230 ATP 488	 2052 ATP 496
 1950 ATP 496	 1153 ATP 503	 1939 ATP 506
 1690 ATP 511	 1082 ATP 526	 11 ATP 533
 2022 ATP 552	 1235 ATP 725	 1669 ATP 736
 1660 ATP 806	 988 ATP 271	 994 ATP 374
 989 ATP 395	 992 ATP 431	 991 ATP 458
 508 ATP 151	 588 ATP 157	 297 ATP 181
 223 ATP 209	 676 ATP 226	 467 ATP 231

 608 ATP 240	 759 ATP 249	 603 ATP 252
 266 ATP 259	 710 ATP 265	 25 ATP 271
 460 ATP 273	 263 ATP 319	 888 ATP 325
 1143 ATP 327	 521 ATP 333	 1723 ATP 341
 462 ATP 353	 2013 ATP 367	 734 ATP 374
 2014 ATP 386	 1152 ATP 389	 226 ATP 404

 607 ATP 478	 969 ATP 499
 1721 ATP 505	 2193 ATP 600
 1119 ATP 458	 1677 ATP 462
 1268 ATP 477	 2194 ATP 483
 678 ATP 451	 890 ATP 381
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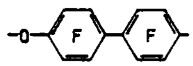
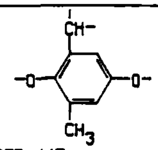
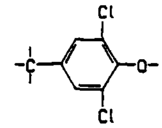
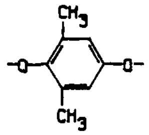
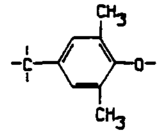
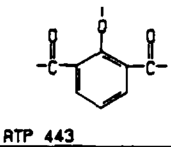
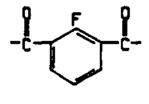
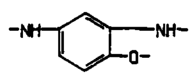
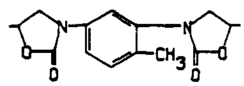
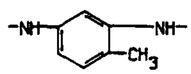
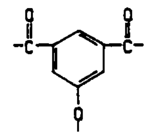
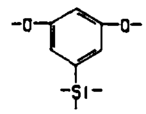
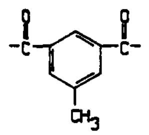
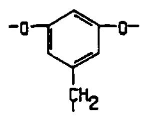
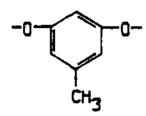
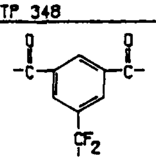
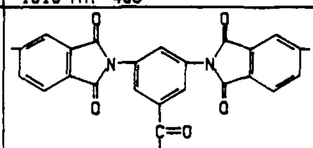
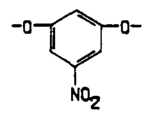
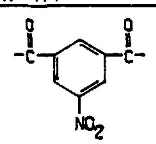
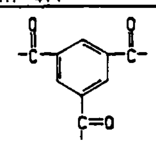
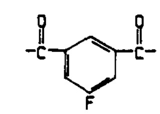
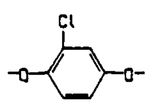
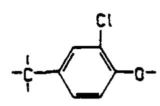
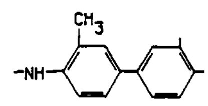
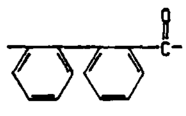
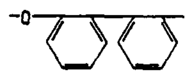
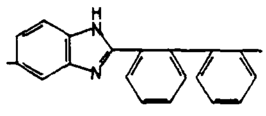
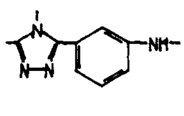
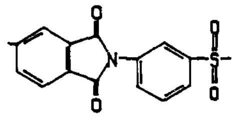
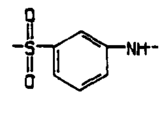
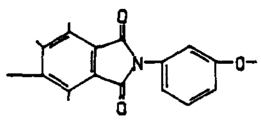
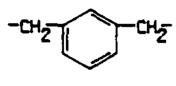
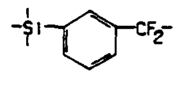
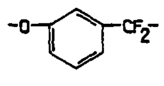
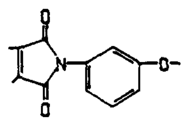
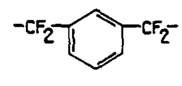
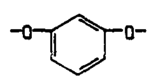
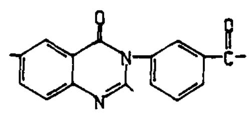
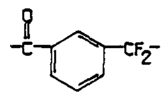
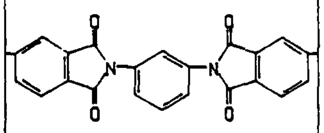
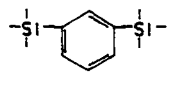
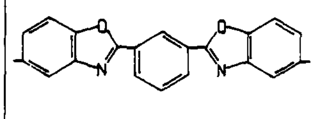
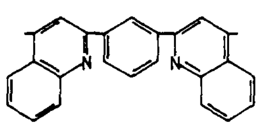
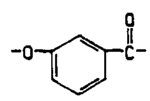
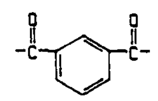
 207 ATP 411	 2115 ATP 447	 970 ATP 447
 2117 ATP 490	 1096 ATP 516	 490 ATP 443
 125 ATP 416	 574 ATP 207	 2179 ATP 350
 563 ATP 449	 483 ATP 293	 905 ATP 345
 1017 ATP 348	 1010 ATP 406	 1154 ATP 465
 1072 ATP 474	 2196 ATP 477	 1099 ATP 478
 1906 ATP 563	 1581 ATP 576	 124 ATP 405
 2005 ATP 408	 955 ATP 439	 2133 ATP 520

 1946 ATP 475	 1266 ATP 541	 1780 ATP 659
 1969 ATP 168	 1765 ATP 280	 1763 ATP 280
 1770 ATP 307	 44 ATP 308	 127 ATP 333
 800 ATP 342	 2113 ATP 346	 157 ATP 377
 1071 ATP 400	 2187 ATP 401	 794 ATP 401
 2197 ATP 406	 1151 ATP 416	 2169 ATP 432
 2161 ATP 433	 95 ATP 433	 243 ATP 444

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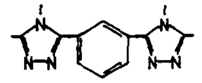
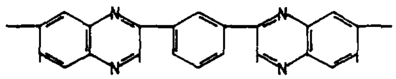
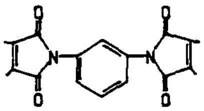
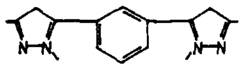
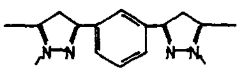
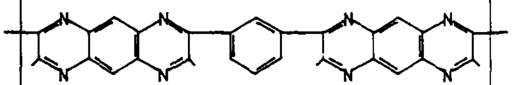
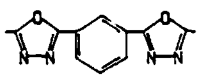
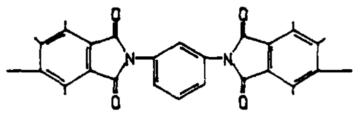
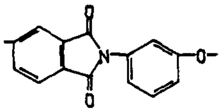
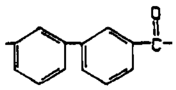
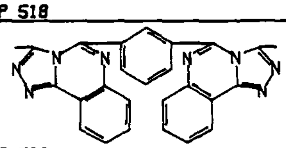
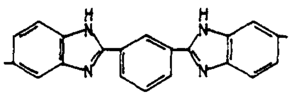
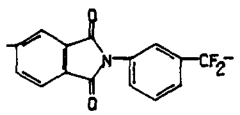
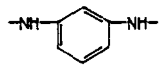
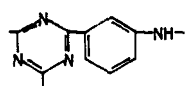
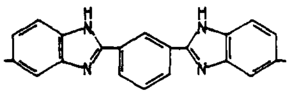
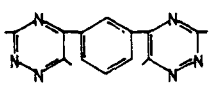
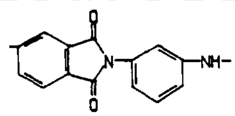
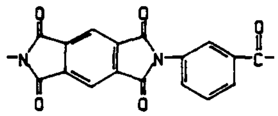
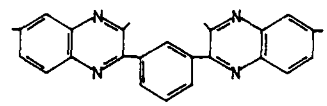
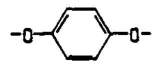
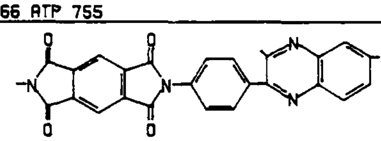
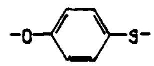
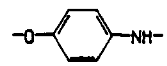
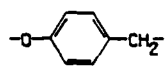
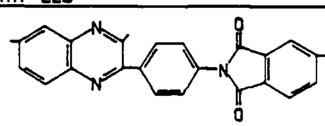
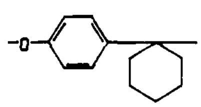
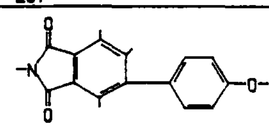
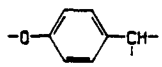
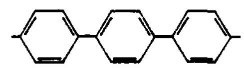
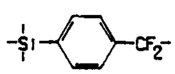
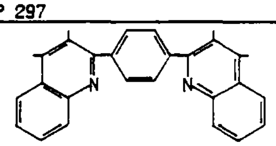
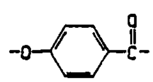
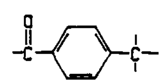
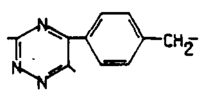
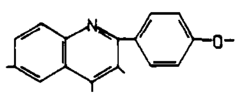
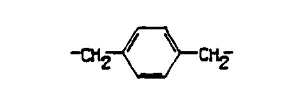
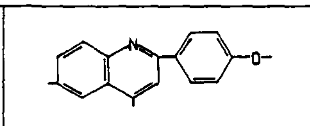
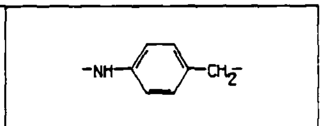
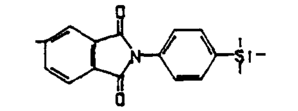
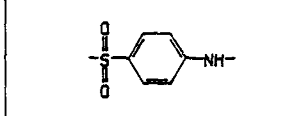
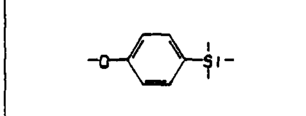
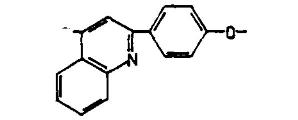
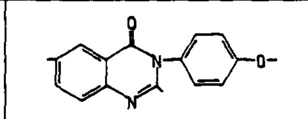
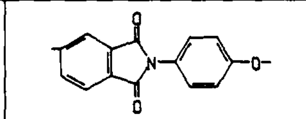
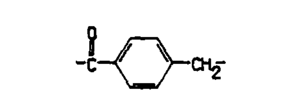
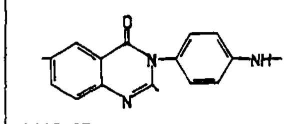
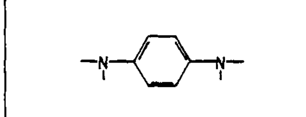
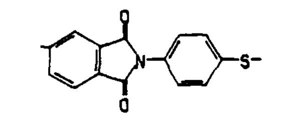
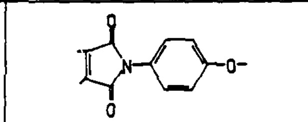
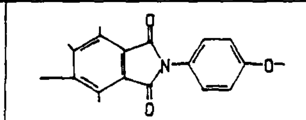
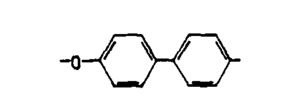
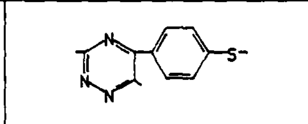
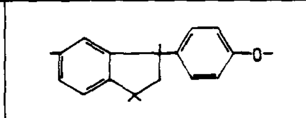
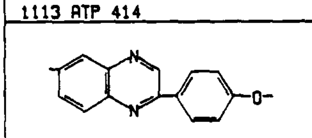
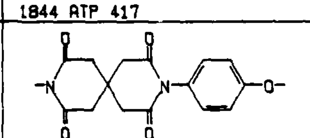
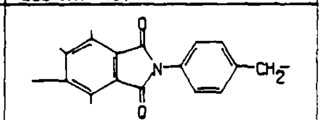
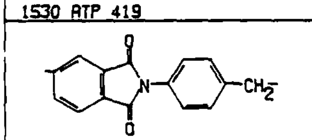
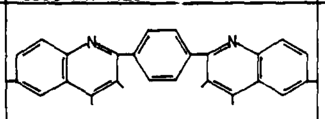
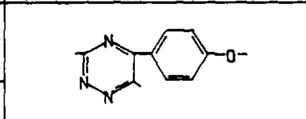
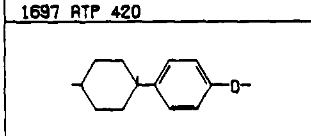
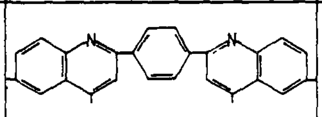
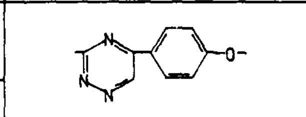
 1121 ATP 449	 2149 ATP 453
 2137 ATP 462	 2086 ATP 464
 2084 ATP 466	 1272 ATP 493
 1200 ATP 494	 2078 ATP 495
 1727 ATP 518	 799 ATP 531
 2207 ATP 536	 2178 ATP 549
 2041 ATP 555	 1234 ATP 559
 1801 ATP 560	 2163 ATP 617
 2080 ATP 635	 1691 ATP 642

 1503 ATP 690	 2066 ATP 755
 673 ATP 162	 2058 ATP 175
 1112 ATP 218	 1237 ATP 229
 651 ATP 234	 2184 ATP 237
 129 ATP 287	 1774 ATP 291
 115 ATP 291	 1531 ATP 297
 131 ATP 308	 2158 ATP 315
 92 ATP 326	 1790 ATP 329
 1866 ATP 330	 1611 ATP 336

 539 ATP 350	 1620 ATP 352	 1761 ATP 356
 1724 ATP 363	 1762 ATP 376	 24 ATP 386
 1629 ATP 388	 1297 ATP 392	 1698 ATP 392
 93 ATP 397	 1292 ATP 401	 1243 ATP 401
 1740 ATP 405	 2010 ATP 409	 1775 ATP 410
 1113 ATP 414	 1844 ATP 417	 959 ATP 417
 1530 ATP 419	 1603 ATP 420	 1777 ATP 420
 1697 ATP 420	 2157 ATP 422	 1824 ATP 425
 660 ATP 427	 2160 ATP 430	 1809 ATP 430

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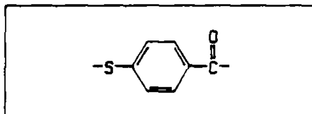
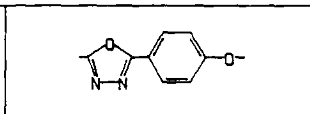
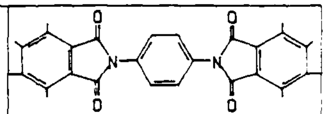
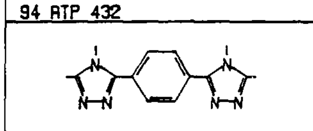
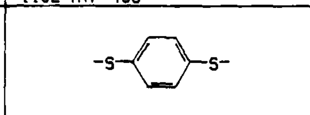
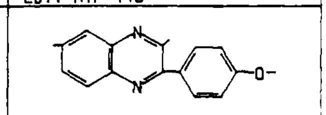
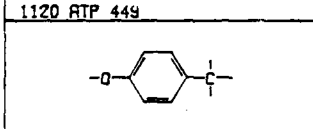
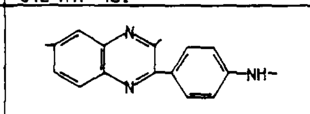
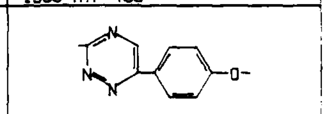
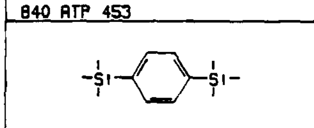
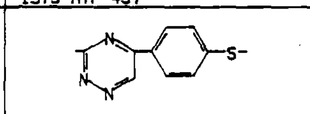
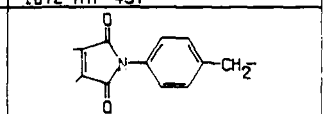
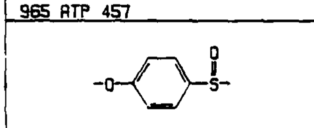
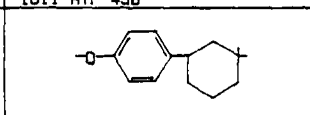
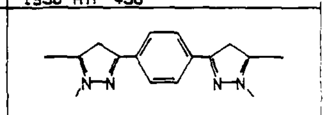
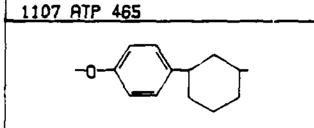
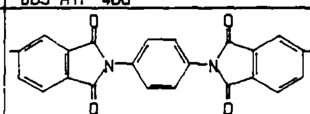
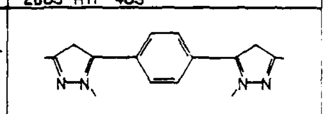
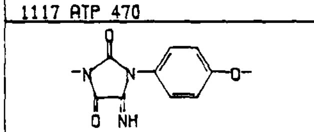
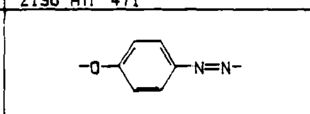
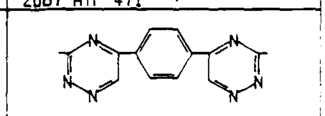
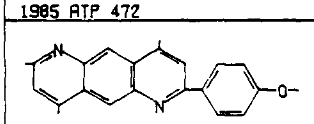
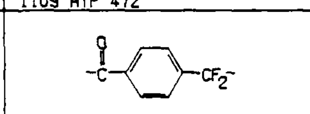
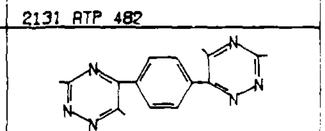
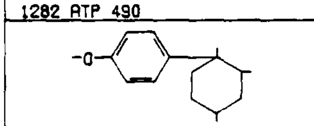
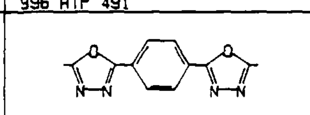
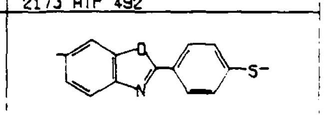
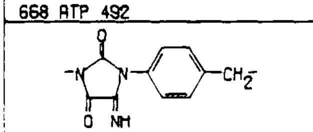
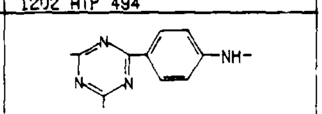
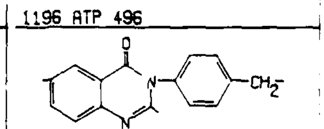
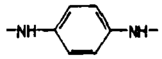
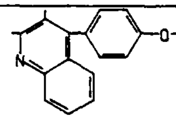
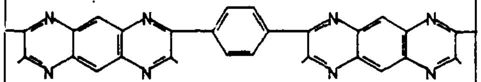
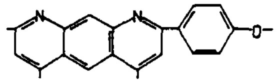
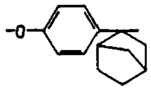
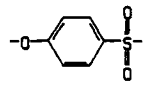
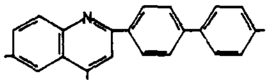
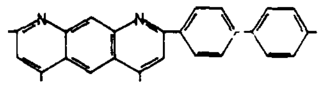
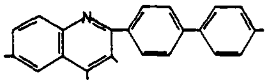
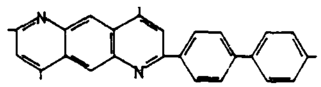
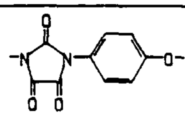
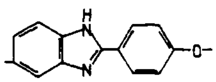
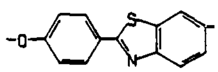
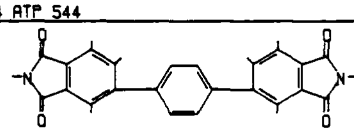
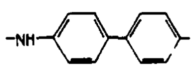
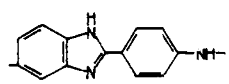
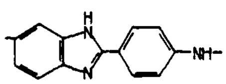
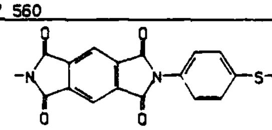
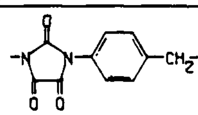
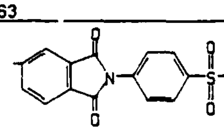
 94 ATP 432	 1102 ATP 436	 2077 ATP 443
 1120 ATP 449	 642 ATP 451	 1535 ATP 453
 840 ATP 453	 1573 ATP 457	 1872 ATP 457
 965 ATP 457	 1811 ATP 458	 1998 ATP 458
 1107 ATP 465	 665 ATP 466	 2085 ATP 469
 1117 ATP 470	 2198 ATP 471	 2087 ATP 471
 1985 ATP 472	 1109 ATP 472	 2131 ATP 482
 1282 ATP 490	 996 ATP 491	 2173 ATP 492
 668 ATP 492	 1202 ATP 494	 1196 ATP 496
 1987 ATP 497	 1804 ATP 500	 1295 ATP 503

 1236 ATP 503	 1623 ATP 504
 1274 ATP 505	 1283 ATP 510
 1118 ATP 510	 666 ATP 511
 1617 ATP 517	 1281 ATP 523
 1608 ATP 527	 1279 ATP 530
 1981 ATP 541	 1644 ATP 544
 1225 ATP 548	 2192 ATP 550
 1678 ATP 551	 2098 ATP 560
 1670 ATP 560	 1523 ATP 563
 1979 ATP 566	 1703 ATP 571

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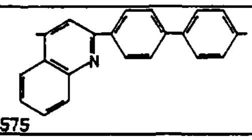
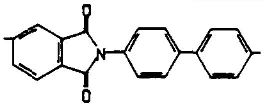
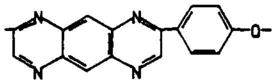
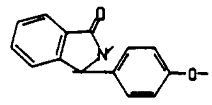
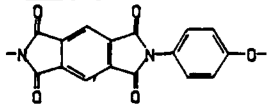
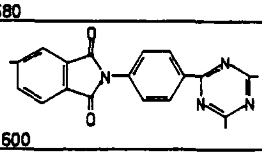
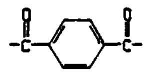
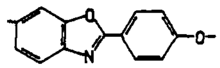
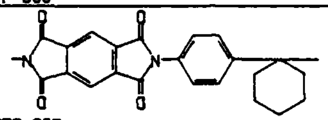
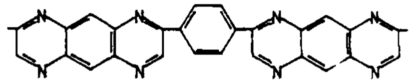
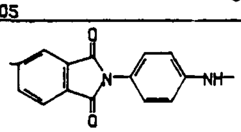
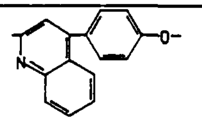
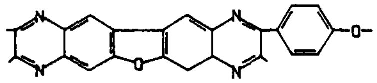
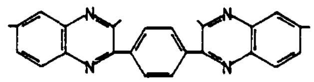
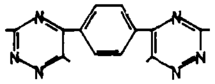
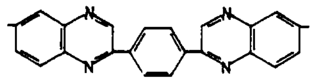
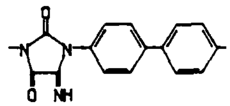
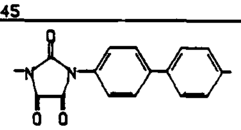
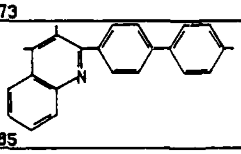
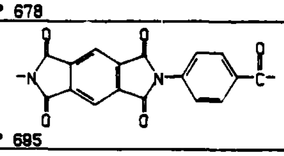
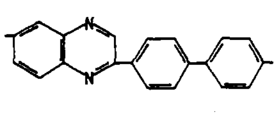
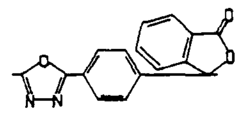
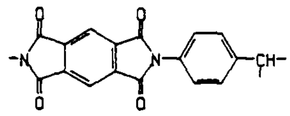
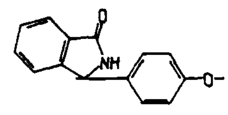
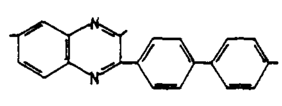
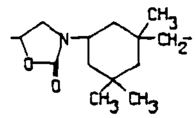
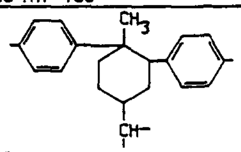
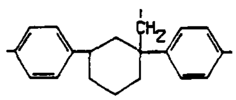
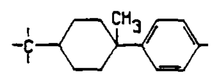
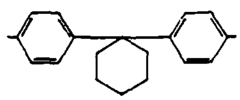
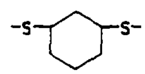
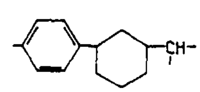
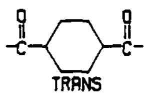
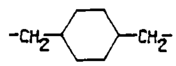
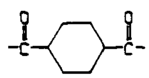
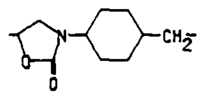
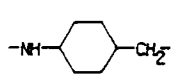
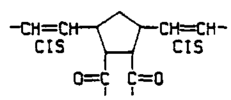
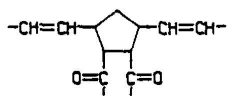
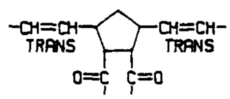
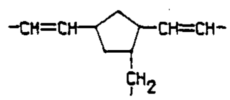
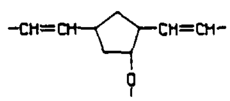
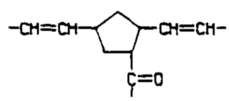
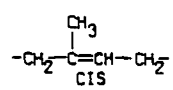
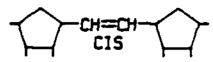
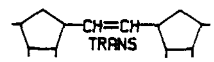
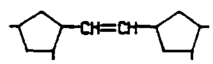
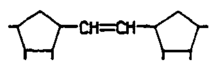
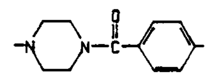
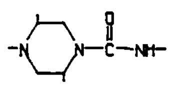
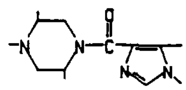
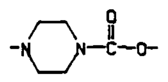
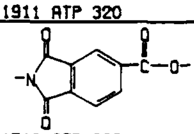
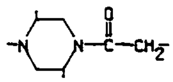
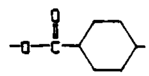
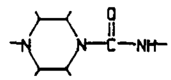
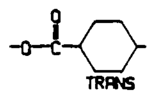
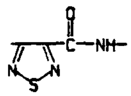
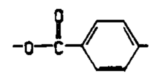
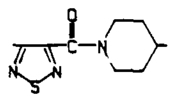
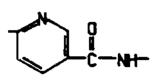
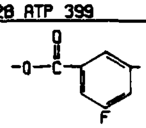
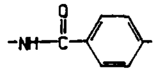
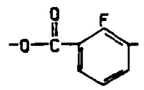
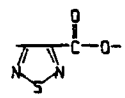
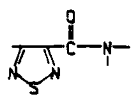
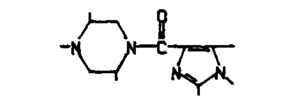
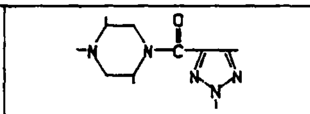
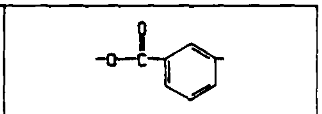
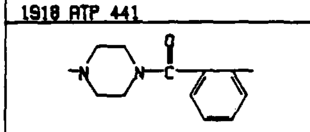
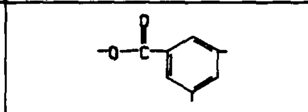
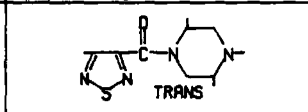
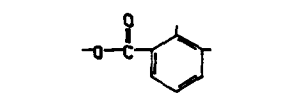
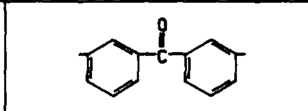
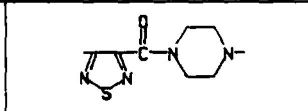
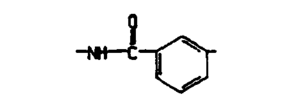
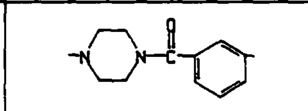
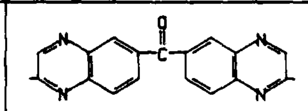
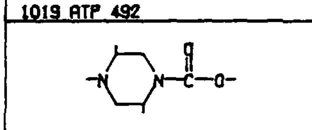
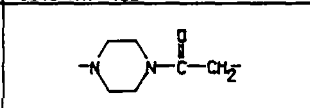
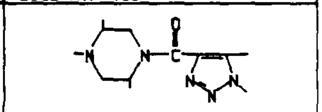
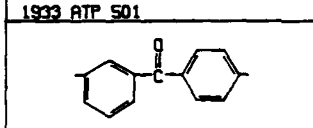
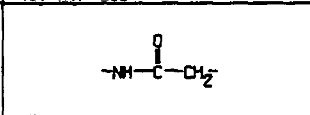
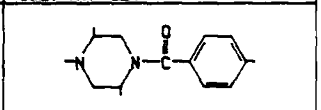
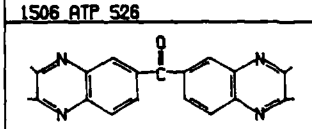
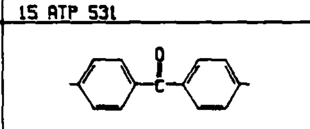
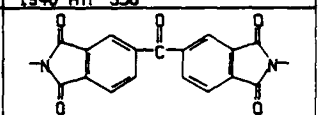
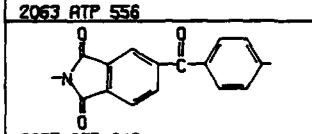
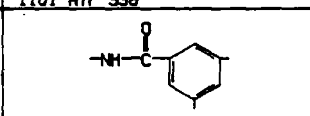
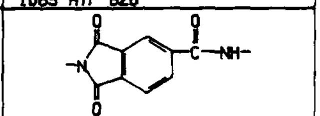
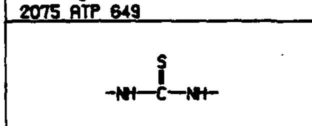
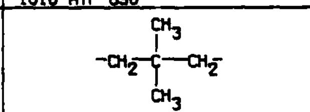
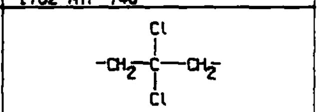
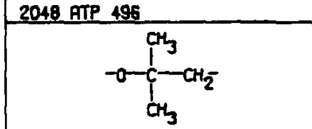
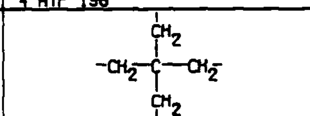
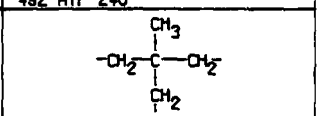
 1633 ATP 575	 1679 ATP 577
 1277 ATP 579	 721 ATP 580
 1513 ATP 597	 1701 ATP 600
 142 ATP 600	 1194 ATP 602
 1508 ATP 605	 1276 ATP 608
 1760 ATP 608	 1630 ATP 613
 1181 ATP 614	 2068 ATP 616
 2081 ATP 637	 2062 ATP 645
 1990 ATP 673	 1984 ATP 678
 1626 ATP 685	 1507 ATP 695

 1527 ATP 717	 1203 ATP 724	 1501 ATP 753
 738 ATP 758	 1565 ATP 837	 2206 ATP 454
 953 ATP 492	 663 ATP 436	 952 ATP 448
 130 ATP 446	 579 ATP 214	 1116 ATP 470
 1904 ATP 400	 1233 ATP 324	 601 ATP 387
 1208 ATP 452	 1231 ATP 488	 1162 ATP 305
 1168 ATP 353	 689 ATP 389	 1164 ATP 256
 1166 ATP 271	 1167 ATP 382	 304 ATP 203

TR 88044

$-CH_2-C(CH_3)=CH-CH_2-$ CIS 304 ATP 203	$-CH_2-C(CH_3)=CH-CH_2-$ TRANS 307 ATP 268	$-CH_2-C(Cl)=CH-CH_2-$ TRANS 139 ATP 303	$-CH_2-CH=CH-CH_2-$ CIS 120 ATP 266
$-CH(-)-CH=CH-CH_2-$ CIS 377 ATP 288	 1163 ATP 305	$-CH_2-CH=CH-CH_2-$ TRANS 121 ATP 277	 690 ATP 389
 1165 ATP 99	 1169 ATP 353	$-C(=O)-CH=CH-C(=O)-$ 591 ATP 394	$-N(-)-C(=O)-CH_2-$ 704 ATP 169
$-O-C(=O)-NH-$ 445 ATP 202	$-O-C(=O)-CH(-)-$ 177 ATP 218	$-O-C(=O)-CH_2-$ 178 ATP 232	 3 ATP 238
$-O-C(=O)-CF_2-$ 596 ATP 257	 1920 ATP 265	 1925 ATP 298	$-S-C(=O)-CH(-)-$ 1911 ATP 320
 1004 ATP 329	$-O-C(=O)-O-$ 110 ATP 347	$-NH-C(=O)-NH-$ 1954 ATP 357	 1710 ATP 360
 1917 ATP 366	 599 ATP 368	$-O-C(=O)-CH=CH-$ 590 ATP 383	 1957 ATP 385
 1905 ATP 394	 1228 ATP 399	 87 ATP 401	 1257 ATP 402
 1959 ATP 404	 117 ATP 405	 104 ATP 405	$-S-C(=O)-CH_2-$ 556 ATP 412
 126 ATP 426	 1244 ATP 428	 1227 ATP 428	$-O-C(=O)-C(=O)-$ 544 ATP 439

 1918 ATP 441	 1929 ATP 452	 242 ATP 452
 1945 ATP 475	 733 ATP 476	 1259 ATP 477
 430 ATP 482	 1504 ATP 487	 1249 ATP 490
 1019 ATP 492	 1949 ATP 493	 2152 ATP 496
 1933 ATP 501	 437 ATP 513	 1927 ATP 524
 1506 ATP 526	 15 ATP 531	 1940 ATP 538
 2063 ATP 556	 1101 ATP 556	 1085 ATP 628
 2075 ATP 649	 1016 ATP 690	 1702 ATP 740
 2048 ATP 496	 4 ATP 196	 492 ATP 240
 231 ATP 246	 847 ATP 289	 382 ATP 293

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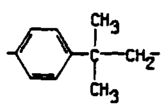
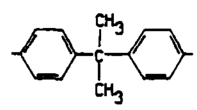
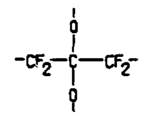
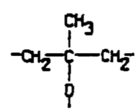
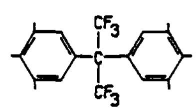
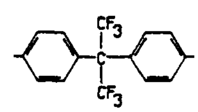
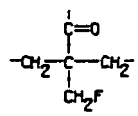
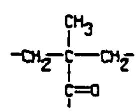
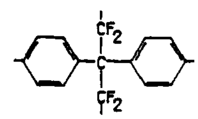
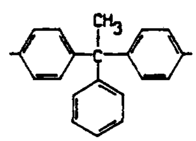
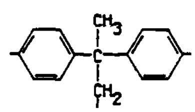
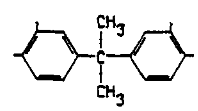
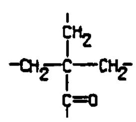
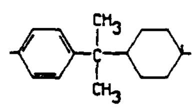
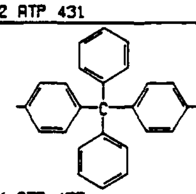
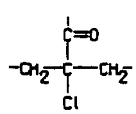
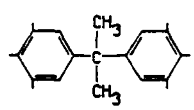
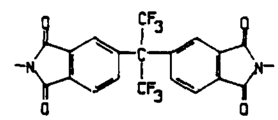
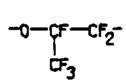
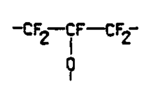
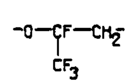
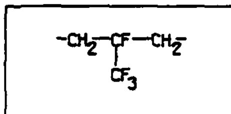
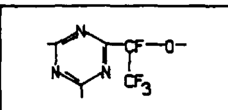
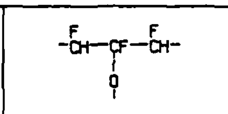
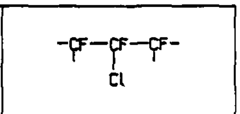
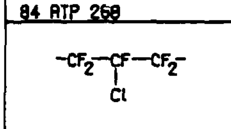
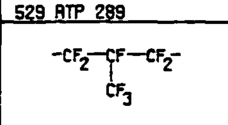
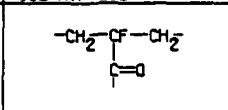
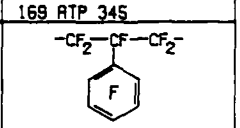
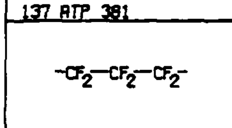
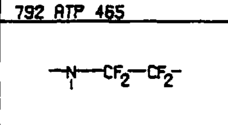
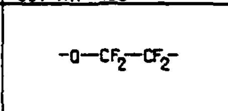
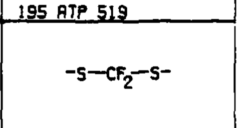
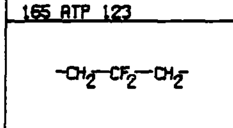
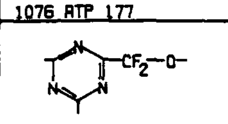
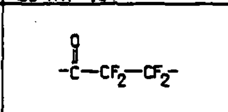
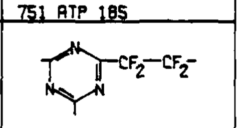
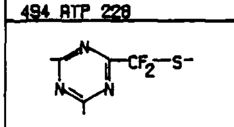
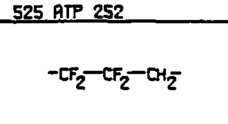
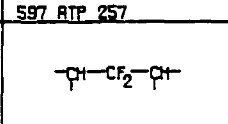
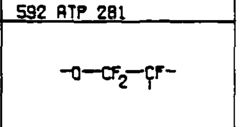
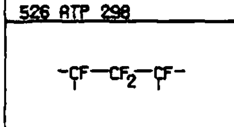
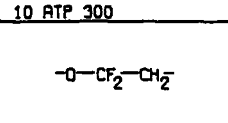
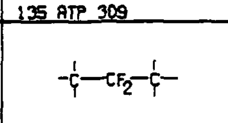
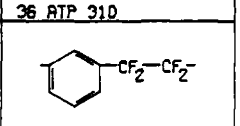
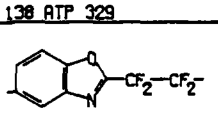
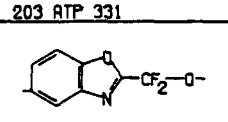
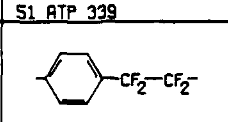
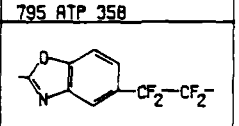
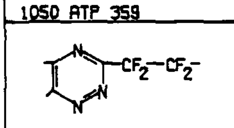
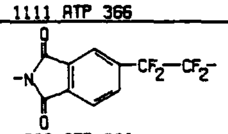
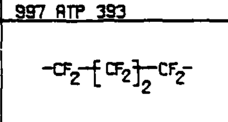
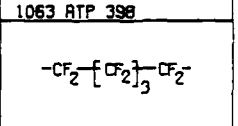
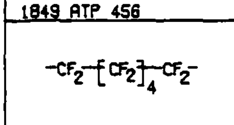
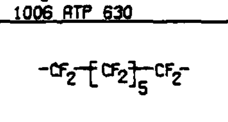
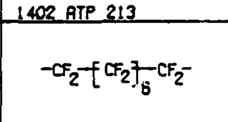
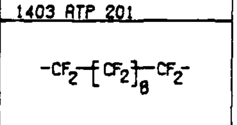
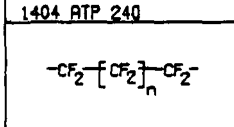
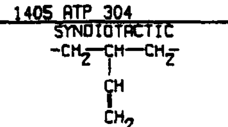
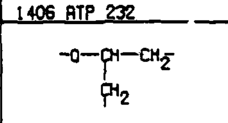
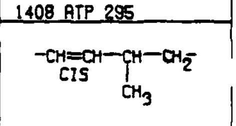
 646 ATP 311	 89 ATP 323	 50 ATP 339
 1074 ATP 350	 2145 ATP 370	 827 ATP 377
 788 ATP 387	 148 ATP 389	 171 ATP 404
 654 ATP 409	 839 ATP 414	 2132 ATP 431
 807 ATP 458	 657 ATP 469	 1114 ATP 475
 330 ATP 492	 2089 ATP 517	 2074 ATP 713
 39 ATP 214	 55 ATP 254	 2055 ATP 255

 84 ATP 268	 529 ATP 289	 132 ATP 299	 169 ATP 345
 137 ATP 381	 792 ATP 465	 817 ATP 468	 195 ATP 519
 165 ATP 123	 1076 ATP 177	 26 ATP 184	 751 ATP 185
 494 ATP 228	 525 ATP 252	 597 ATP 257	 592 ATP 281
 526 ATP 298	 10 ATP 300	 135 ATP 309	 36 ATP 310
 138 ATP 329	 203 ATP 331	 51 ATP 339	 795 ATP 358
 1050 ATP 359	 1111 ATP 366	 997 ATP 393	 1063 ATP 398
 1849 ATP 456	 1006 ATP 630	 1402 ATP 213	 1403 ATP 201
 1404 ATP 240	 1405 ATP 304	 1406 ATP 232	 1408 ATP 295
 1421 ATP 400	 531 ATP 216	 572 ATP 67	 372 ATP 171

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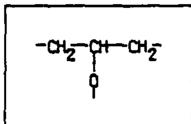
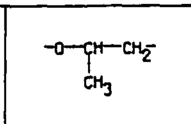
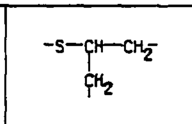
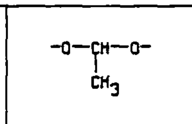
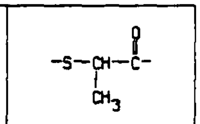
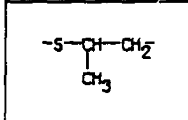
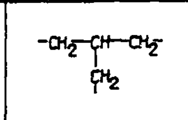
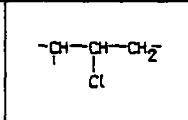
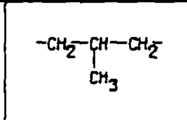
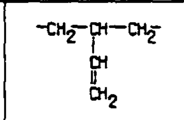
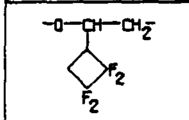
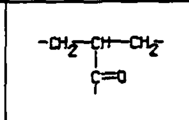
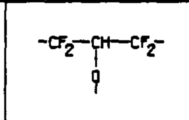
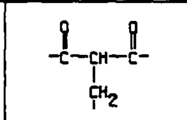
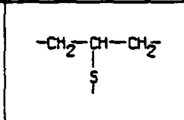
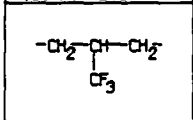
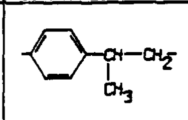
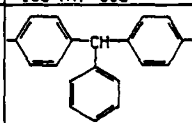
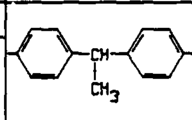
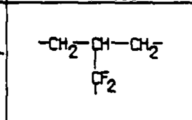
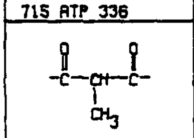
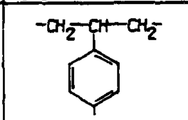
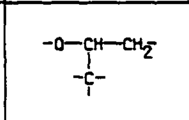
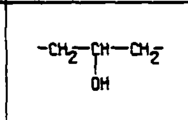
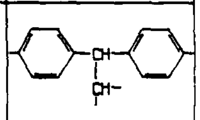
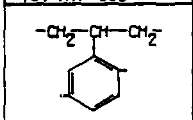
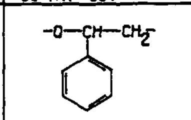
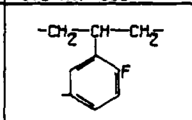
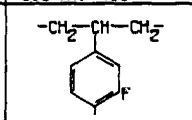
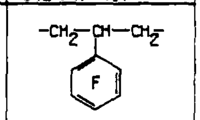
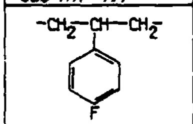
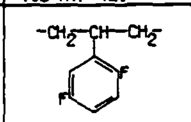
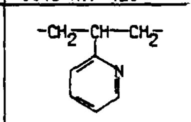
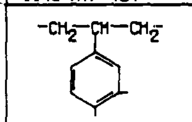
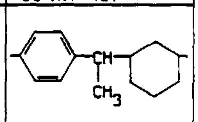
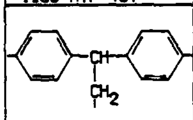
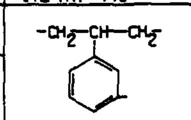
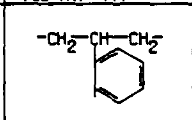
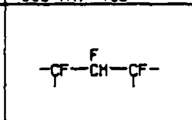
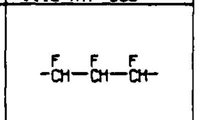
 459 ATP 185	 435 ATP 195	 547 ATP 197	 455 ATP 213	 1910 ATP 235
 184 ATP 240	 74 ATP 251	 385 ATP 272	 431 ATP 280	 403 ATP 289
 436 ATP 293	 56 ATP 299	 136 ATP 309	 176 ATP 324	 1047 ATP 335
 715 ATP 336	 649 ATP 342	 712 ATP 352	 128 ATP 352	 107 ATP 373
 784 ATP 380	 66 ATP 387	 973 ATP 389	 503 ATP 409	 842 ATP 417
 856 ATP 417	 708 ATP 421	 1148 ATP 421	 1149 ATP 424	 85 ATP 437
 1150 ATP 437	 172 ATP 446	 756 ATP 447	 860 ATP 458	 1115 ATP 535
 843 ATP 547	 904 ATP 571	 373 ATP 695	 134 ATP 299	 761 ATP 356
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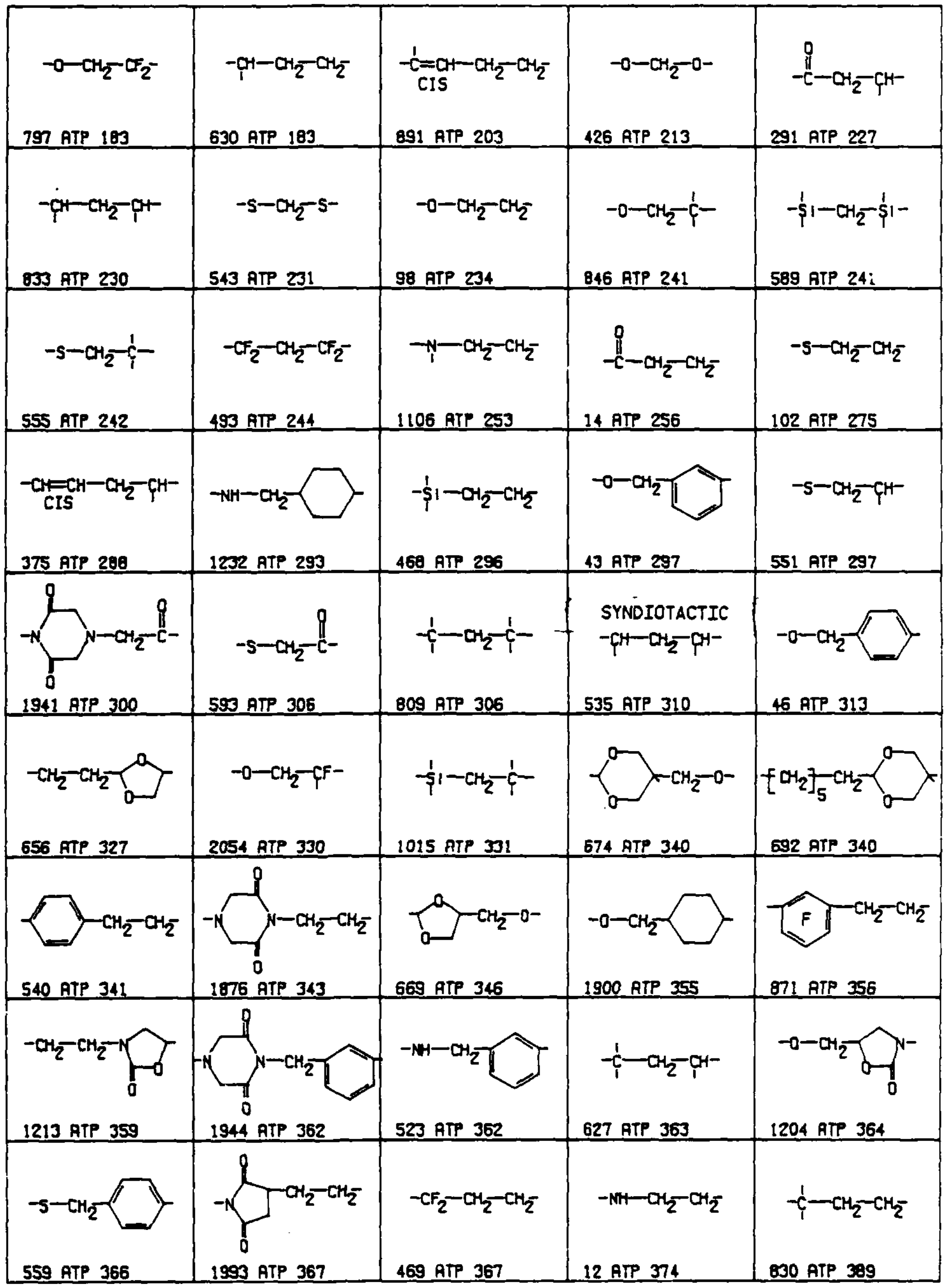
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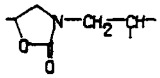
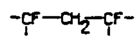
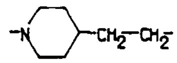
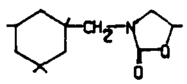
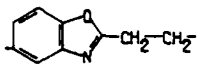
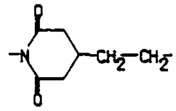
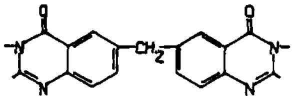
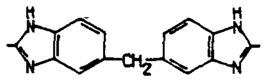
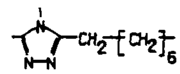
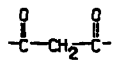
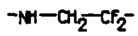
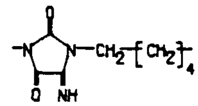
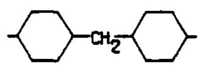
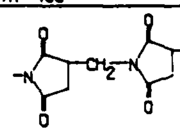
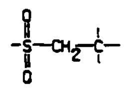
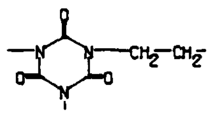
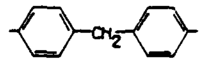
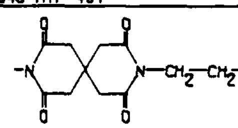
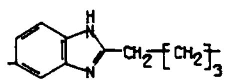
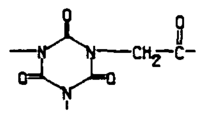
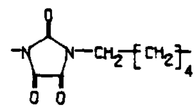
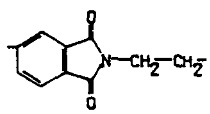
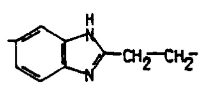
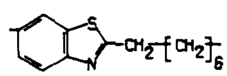
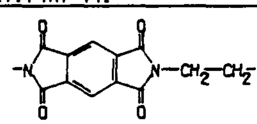
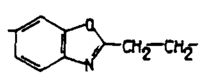
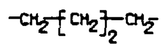
 2180 ATP 394	 1124 ATP 399	 1254 ATP 402
 1220 ATP 417	 1184 ATP 428	 1965 ATP 438
 2154 ATP 443	 2164 ATP 443	 1968 ATP 444
 174 ATP 447	 197 ATP 456	 1988 ATP 465
 1207 ATP 470	 1994 ATP 482	 2046 ATP 487
 1912 ATP 489	 96 ATP 512	 1601 ATP 518
 2111 ATP 606	 1874 ATP 647	 1982 ATP 678
 1714 ATP 741	 1673 ATP 781	 2093 ATP 787
 1298 ATP 861	 1197 ATP 1043	 1302 ATP 169

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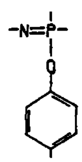
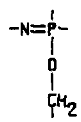
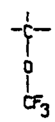
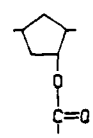
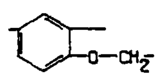
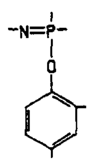
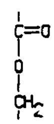
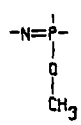
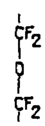
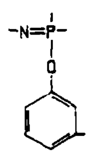
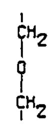
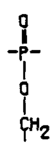
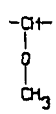
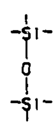
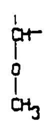
$-CH_2-[CH_2]_8-CH_2-$ 1308 ATP 226	$-CH_2-[CH_2]_9-CH_2-$ 1309 ATP 226	$-CH_2-[CH_2]_{12}-CH_2-$ 1312 ATP 260	$-CH_2-[CH_2]_{14}-CH_2-$ 1314 ATP 194	$-CH_2-[CH_2]_n-CH_2-$ 1321 ATP 155
 625 ATP 70	 163 ATP 126	 49 ATP 140	 471 ATP 189	 726 ATP 191
 586 ATP 207	 164 ATP 213	 48 ATP 224	 2212 ATP 227	 58 ATP 233
 750 ATP 253	 636 ATP 254	 259 ATP 256	 443 ATP 257	 63 ATP 267
 979 ATP 271	 497 ATP 274	 925 ATP 284	 716 ATP 285	 584 ATP 291

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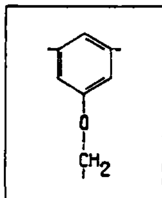
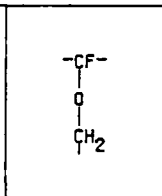
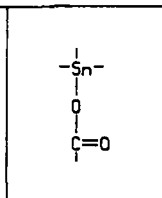
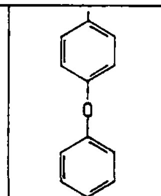
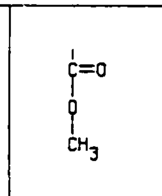
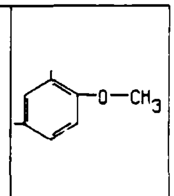
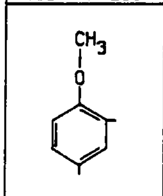
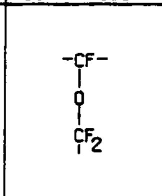
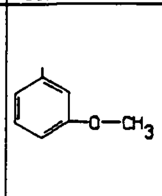
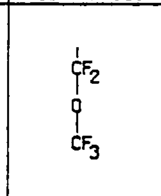
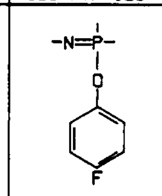
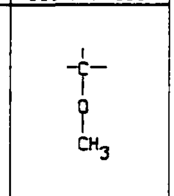
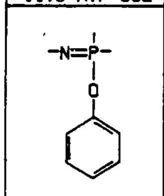
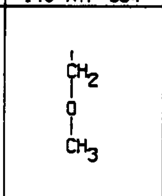
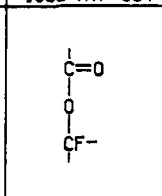
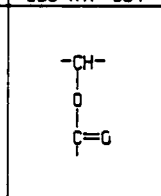
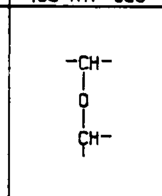
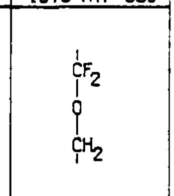
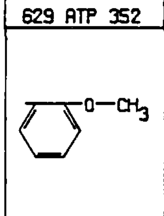
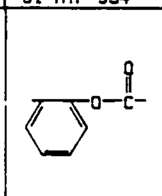
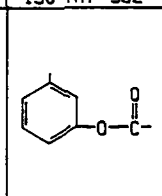
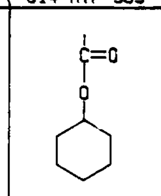
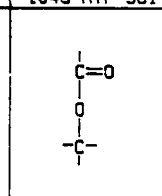
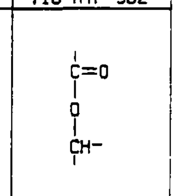
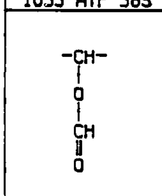
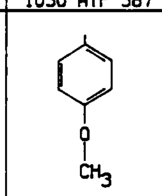
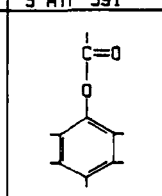
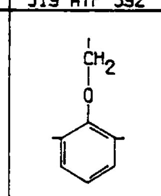
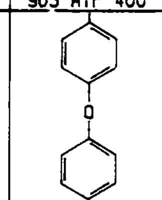
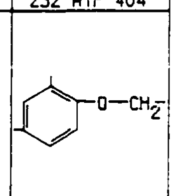
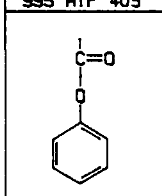
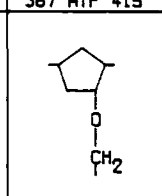
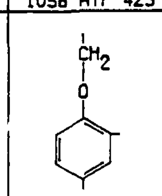
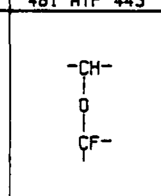
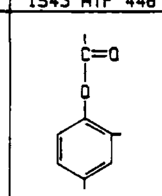
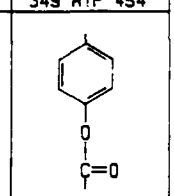
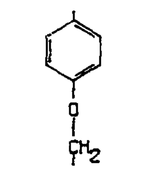
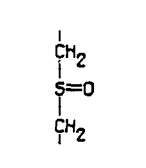
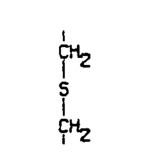
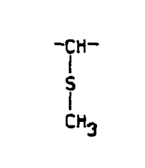
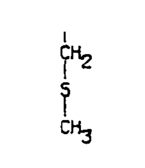
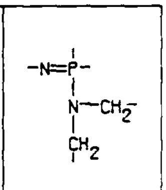
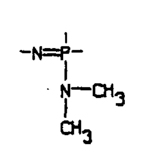
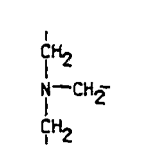
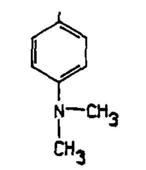
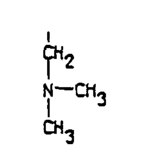
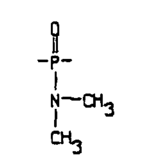
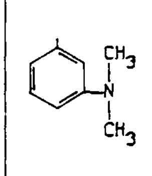
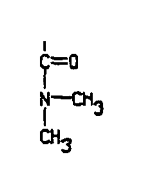
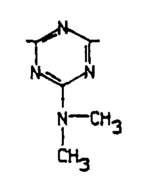
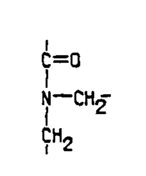
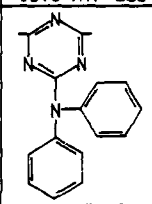
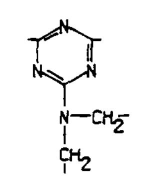
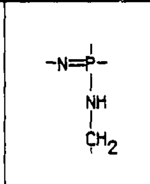
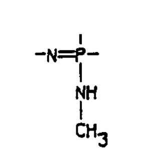
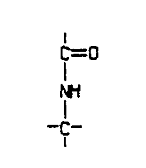
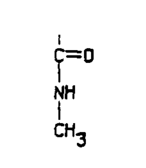
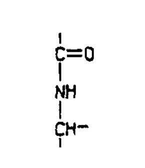
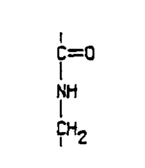
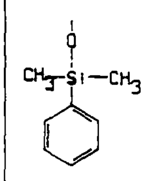
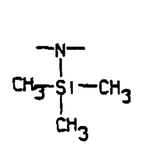
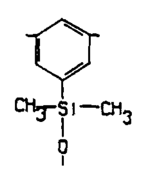
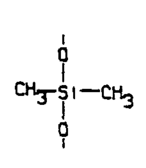
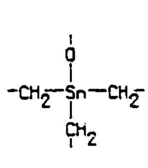
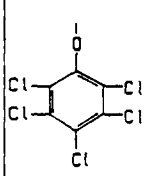
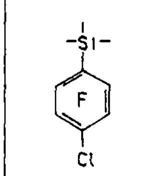
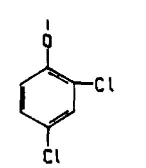
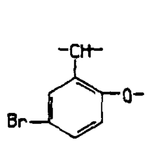
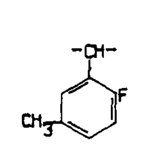
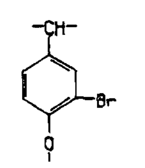
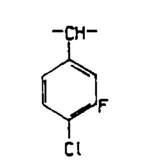
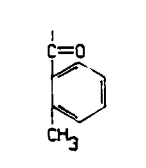
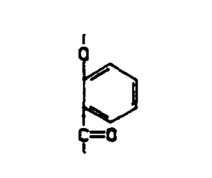
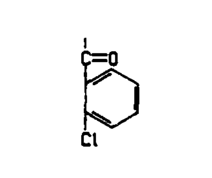
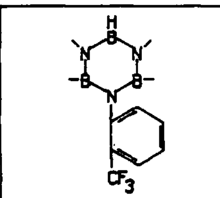
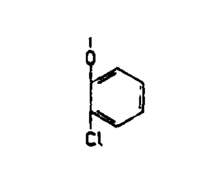
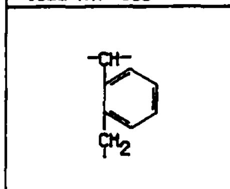
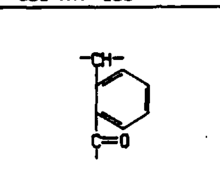
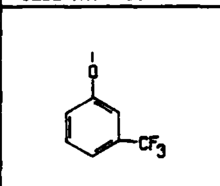
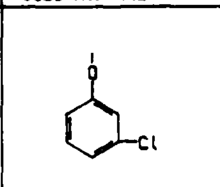
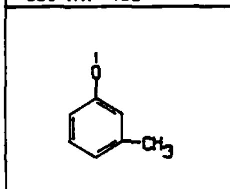
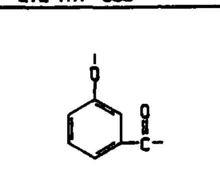
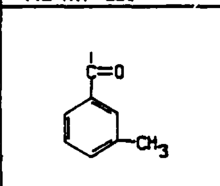
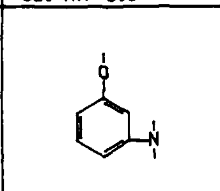
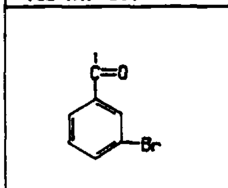
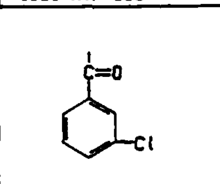
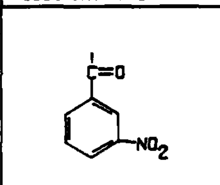
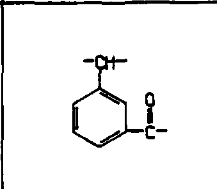
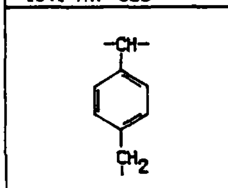
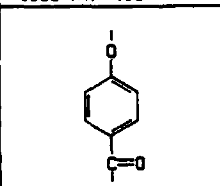
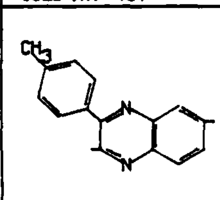
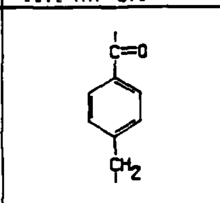
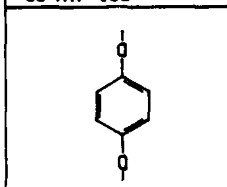
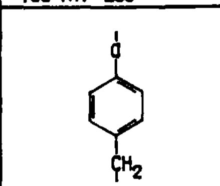
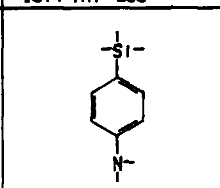
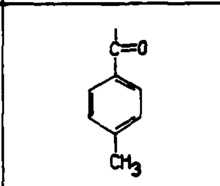
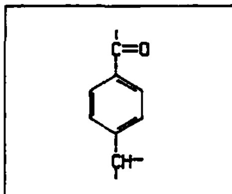
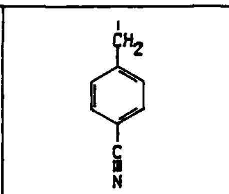
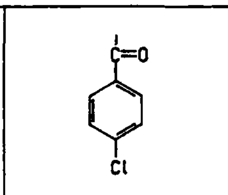
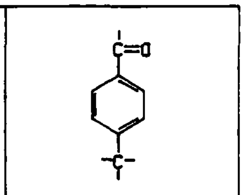
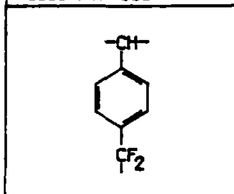
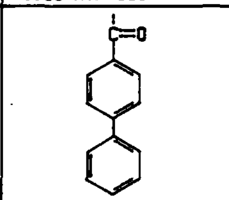
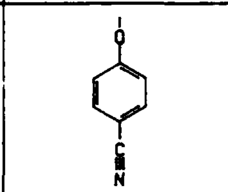
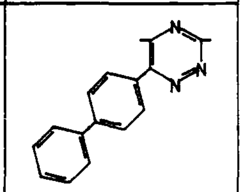
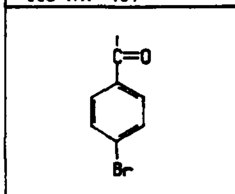
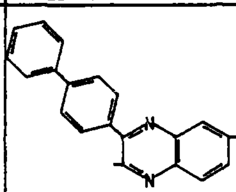
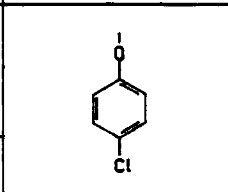
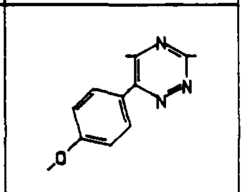
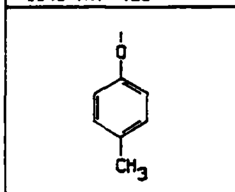
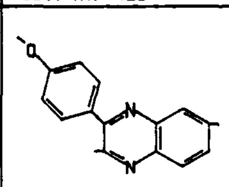
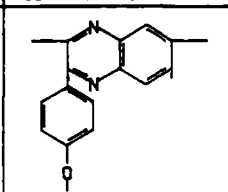
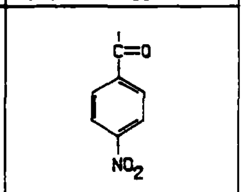
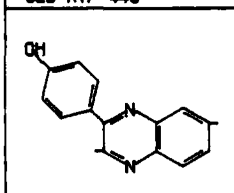
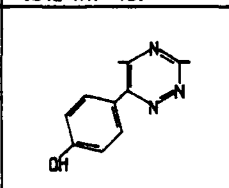
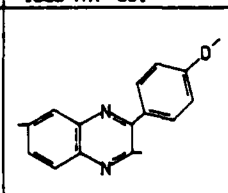
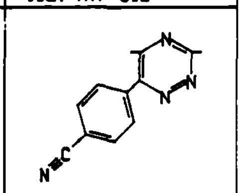
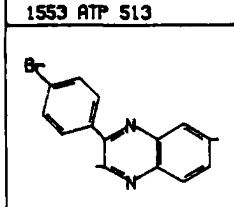
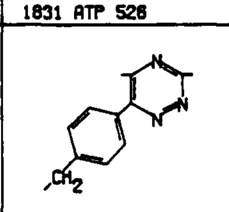
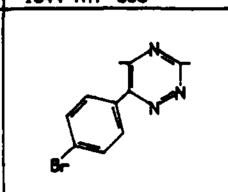
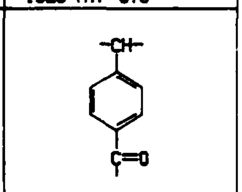
 422 ATP 293	 88 ATP 309	 802 ATP 319	 383 ATP 326	 328 ATP 328	 311 ATP 330
 1173 ATP 332	 140 ATP 334	 1032 ATP 334	 256 ATP 334	 439 ATP 336	 1073 ATP 350
 629 ATP 352	 61 ATP 354	 190 ATP 362	 614 ATP 363	 1049 ATP 381	 718 ATP 382
 1033 ATP 385	 1030 ATP 387	 5 ATP 391	 319 ATP 392	 903 ATP 400	 232 ATP 404
 995 ATP 405	 367 ATP 415	 1056 ATP 423	 481 ATP 443	 1543 ATP 446	 349 ATP 454
 623 ATP 459	 681 ATP 485	 1174 ATP 495	 189 ATP 534	 6 ATP 563	 781 ATP 579

 698 ATP 590	 1052 ATP 323	 742 ATP 225	 1048 ATP 266	 752 ATP 305	 821 ATP 209
 647 ATP 241	 694 ATP 278	 606 ATP 285	 1070 ATP 296	 1046 ATP 310	 1065 ATP 367
 1157 ATP 384	 1692 ATP 479	 400 ATP 503	 1671 ATP 508	 1663 ATP 606	 818 ATP 153
 1170 ATP 305	 399 ATP 420	 316 ATP 424	 396 ATP 490	 393 ATP 506	 951 ATP 163
 612 ATP 185	 915 ATP 223	 929 ATP 223	 780 ATP 319	 1057 ATP 514	 746 ATP 374
 1062 ATP 343	 274 ATP 429	 820 ATP 436	 1172 ATP 511	 355 ATP 442	 1037 ATP 346

 1029 ATP 359	 686 ATP 365	 1262 ATP 407	 1060 ATP 442
 631 ATP 466	 272 ATP 635	 442 ATP 291	 621 ATP 310
 793 ATP 317	 1031 ATP 369	 1036 ATP 376	 1064 ATP 392
 1041 ATP 396	 1039 ATP 415	 1025 ATP 494	 1171 ATP 571
 68 ATP 139	 785 ATP 256	 1574 ATP 295	 1034 ATP 327
 1059 ATP 339	 632 ATP 343	 605 ATP 365	 1035 ATP 366

 2050 ATP 385	 1061 ATP 391	 1038 ATP 405	 838 ATP 406
 113 ATP 407	 1023 ATP 408	 782 ATP 414	 1819 ATP 417
 1040 ATP 428	 1547 ATP 429	 634 ATP 431	 1817 ATP 436
 628 ATP 446	 1542 ATP 497	 1558 ATP 501	 1027 ATP 512
 1553 ATP 513	 1831 ATP 526	 1544 ATP 565	 1829 ATP 579
 1536 ATP 616	 1827 ATP 627	 1825 ATP 631	 980 ATP 651

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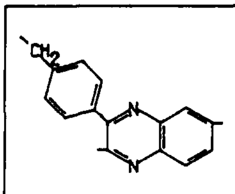	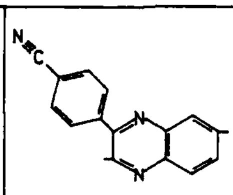	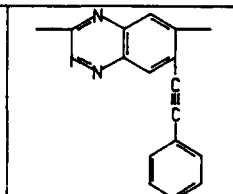	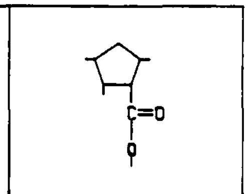
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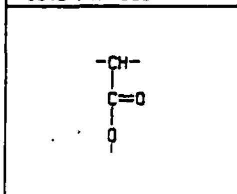	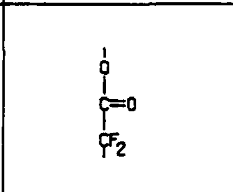	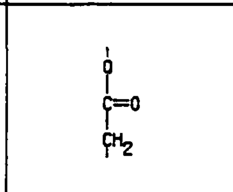	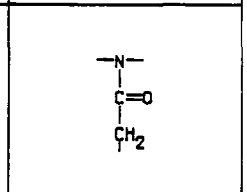
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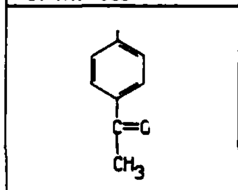	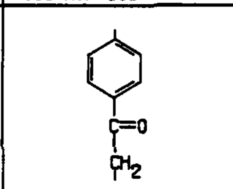	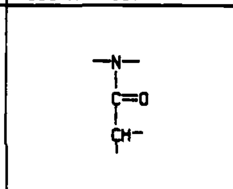	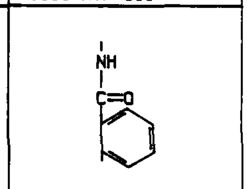
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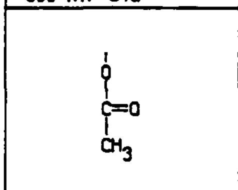	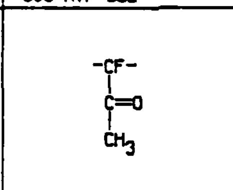	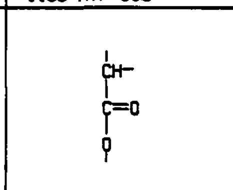	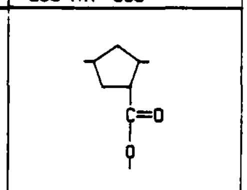
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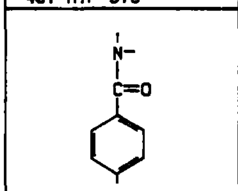	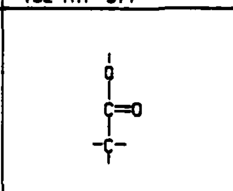	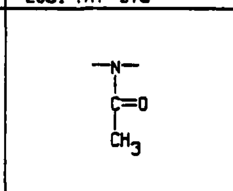	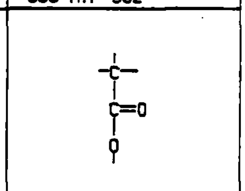
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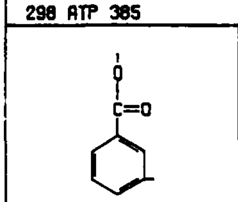	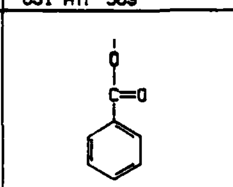	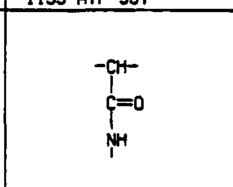	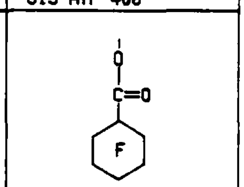
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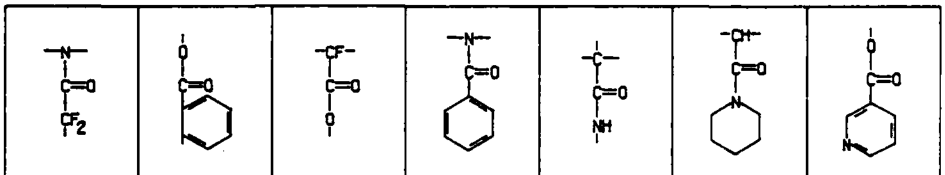

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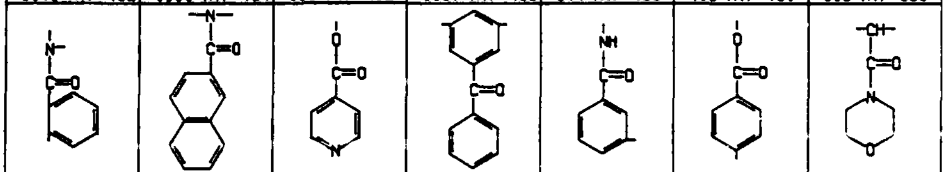
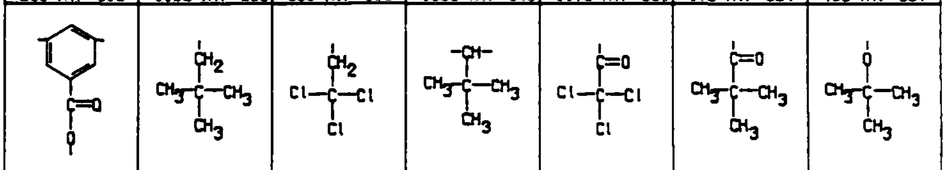
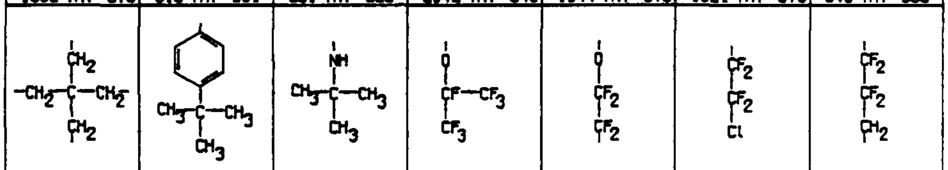


298 ATP 516	1139 ATP 533	986 ATP 535	1683 ATP 548	1175 ATP 551	175 ATP 554	408 ATP 567



1582 ATP 576	619 ATP 301	581 ATP 328	2042 ATP 340	1044 ATP 373	1021 ATP 373	340 ATP 385



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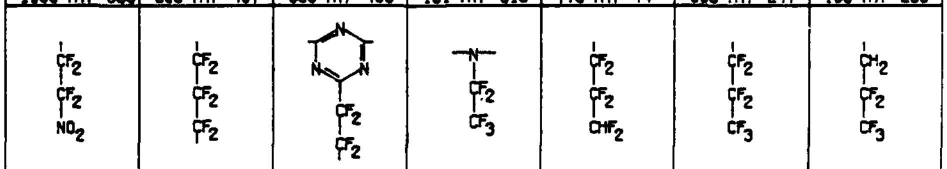
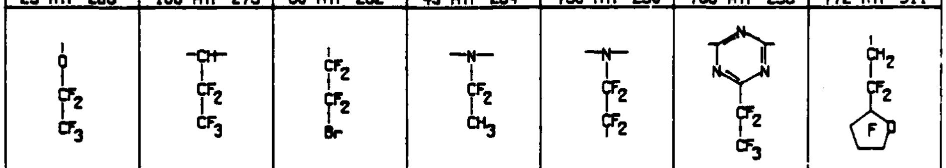
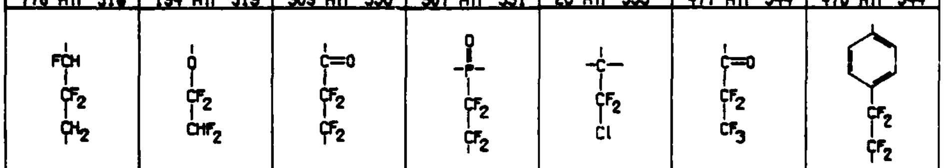


29 ATP 266	166 ATP 279	80 ATP 282	45 ATP 284	790 ATP 290	768 ATP 296	772 ATP 311



776 ATP 318	194 ATP 319	509 ATP 330	507 ATP 331	28 ATP 335	477 ATP 344	470 ATP 344



777 ATP 354	253 ATP 359	1142 ATP 363	990 ATP 395	173 ATP 401	185 ATP 404	114 ATP 407

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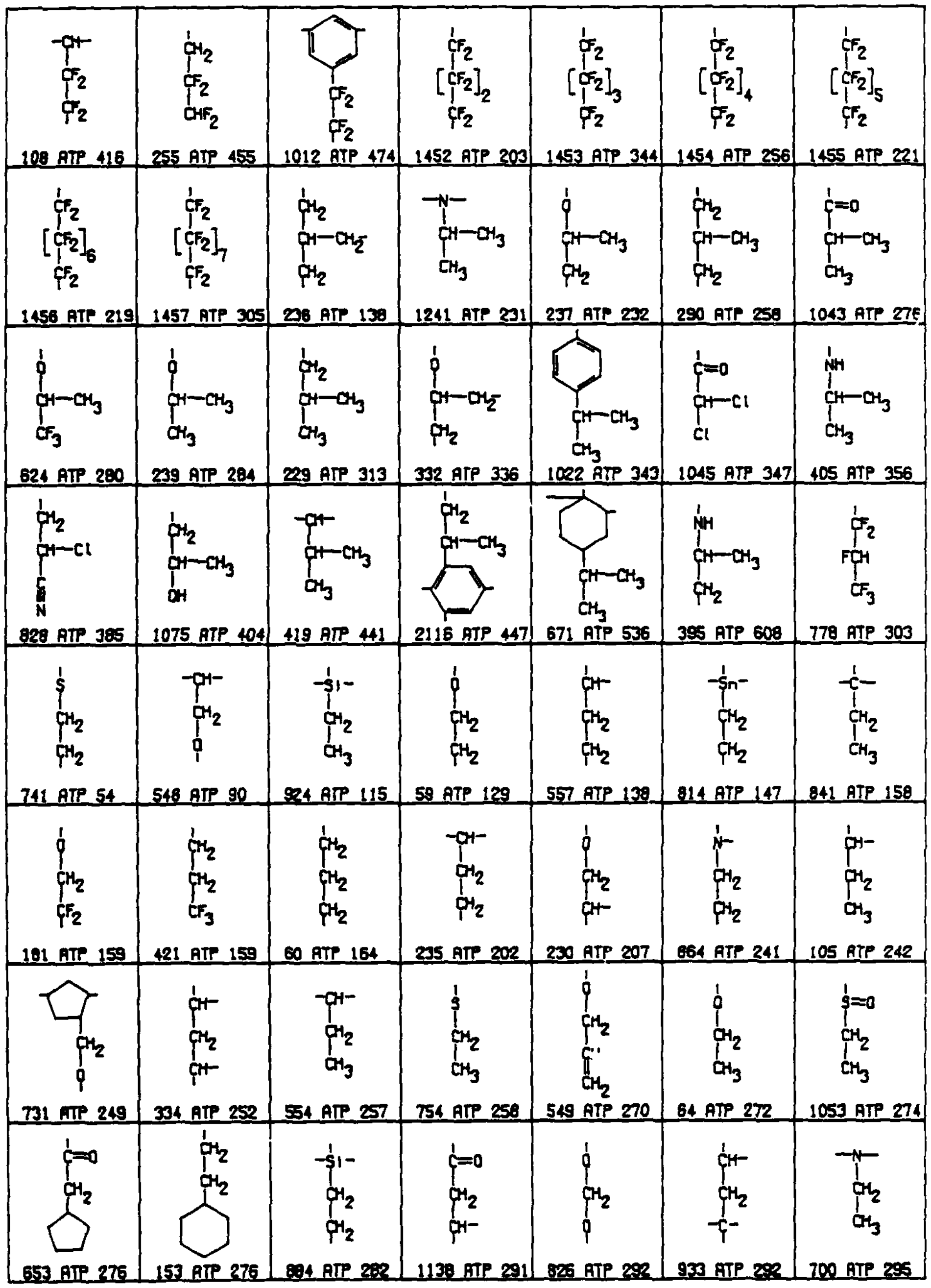
108 ATP 416
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237 ATP 232
290 ATP 258
1043 ATP 276
824 ATP 280
239 ATP 284
229 ATP 313
332 ATP 336
1022 ATP 343
1045 ATP 347
405 ATP 356
828 ATP 385
1075 ATP 404
419 ATP 441
2116 ATP 447
671 ATP 536
395 ATP 608
778 ATP 303
741 ATP 54
548 ATP 90
924 ATP 115
59 ATP 129
557 ATP 138
814 ATP 147
841 ATP 158
181 ATP 159
421 ATP 159
60 ATP 164
235 ATP 202
230 ATP 207
864 ATP 241
105 ATP 242
731 ATP 249
334 ATP 252
554 ATP 257
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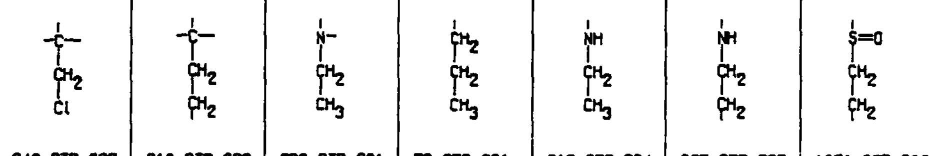
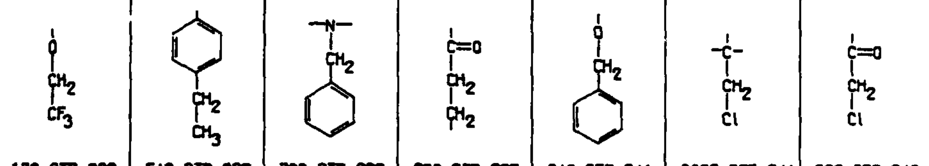
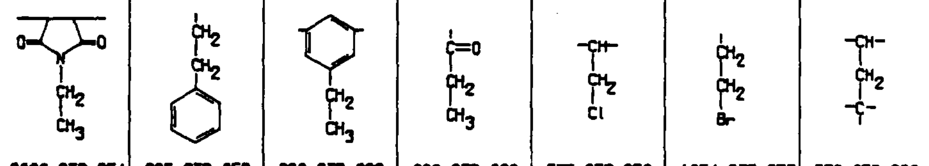
TR 88044



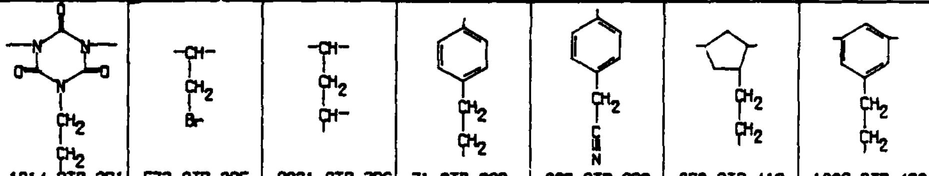
848 ATP 297	810 ATP 299	693 ATP 301	72 ATP 301	819 ATP 304	985 ATP 305	1051 ATP 306



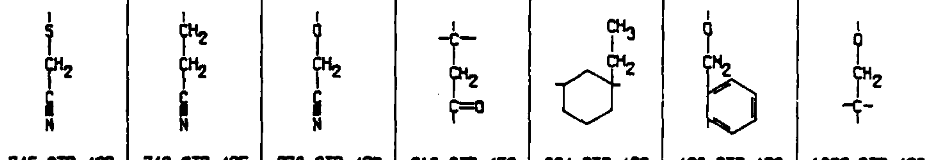
179 ATP 308	542 ATP 326	709 ATP 328	638 ATP 335	840 ATP 341	2032 ATP 341	338 ATP 349



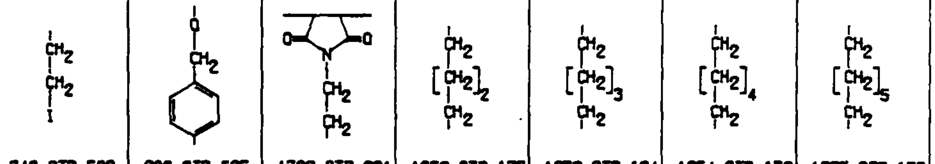
2030 ATP 354	265 ATP 359	993 ATP 362	683 ATP 362	575 ATP 376	1054 ATP 377	576 ATP 386



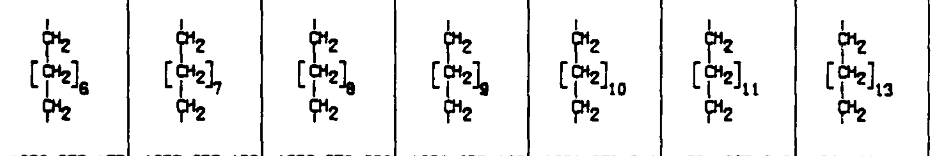
1914 ATP 391	573 ATP 395	2031 ATP 396	71 ATP 399	829 ATP 399	679 ATP 413	1009 ATP 428



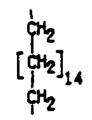
745 ATP 433	743 ATP 435	870 ATP 436	616 ATP 458	664 ATP 466	420 ATP 466	1068 ATP 482



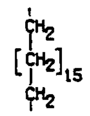
748 ATP 509	206 ATP 525	1783 ATP 891	1352 ATP 175	1353 ATP 184	1354 ATP 172	1355 ATP 175



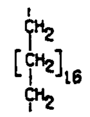
1356 ATP 175	1357 ATP 198	1358 ATP 230	1359 ATP 199	1360 ATP 210	1361 ATP 240	1363 ATP 244



1364 ATP 271



1365 ATP 285



1366 ATP 311

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Table 2

ERROR IN CALCULATED TG ASSOCIATED WITH POLYMERS AND TG RELATIONSHIPS

TABLE 2 TR 88044

ERROR IN CALCULATED TG ASSOCIATED WITH POLMERS AND TG RELATIONSHIPS

Table 5

POLYMERS ASSOCIATED WITH A PARTICULAR ERROR IN CALCULATED TGS

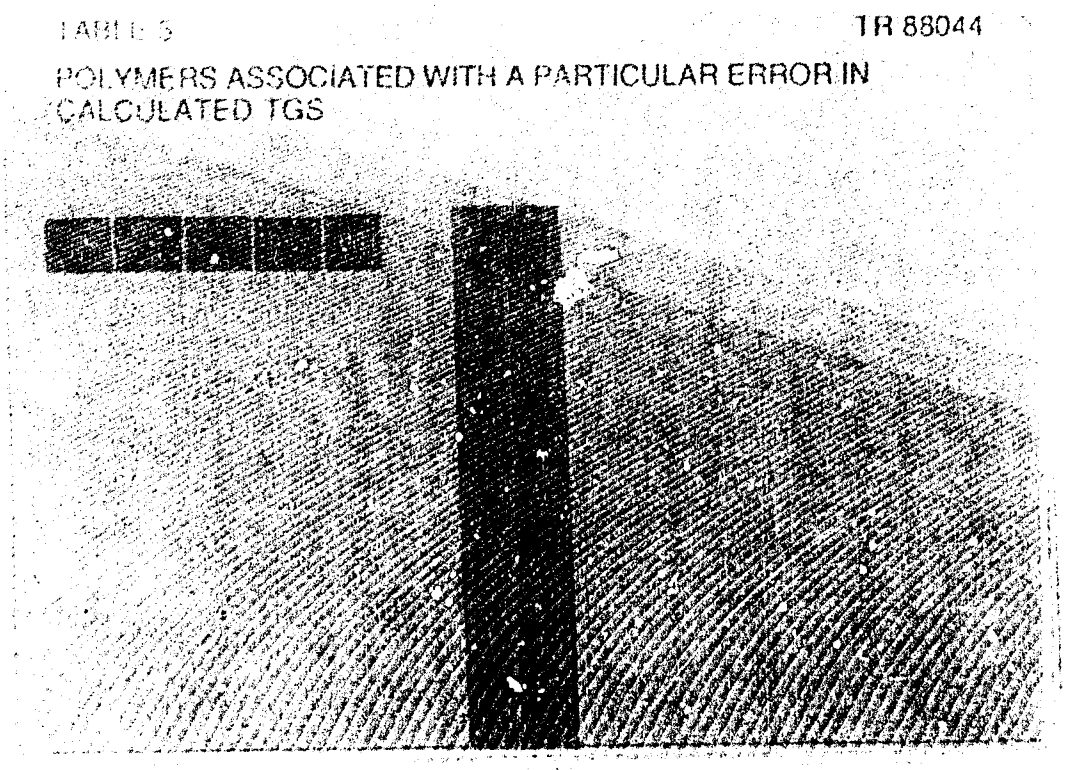

Table 6

ERRORS IN CALCULATED TGS ASSOCIATED WITH PARTICULAR GROUPS

TABLE 6

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ERRORS IN CALCULATED TGS ASSOCIATED WITH PARTICULAR GROUPS

[illegible]

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7. Title Calculation of the glass transition temperatures of linear polymers
Part 3 Evaluation of calculation relationships

7a. (For Translations) Title in Foreign Language

7b. (For Conference Papers) Title, Place and Date of Conference

8. Author 1. Surname, Initials	9a. Author 2	9b. Authors 3, 4	10. Date	Pages	Refs.
Lee, W.A.			June 1988	105	9
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16. Descriptors (Keywords) (Descriptors marked * are selected from TEST)

Polymers. Transitions. Glass temperatures. Calculation.

17. Abstract

Four equations, relating the structure of polymers in numerical form to their glass transition temperatures (Tg)s, are evaluated using a large data set of 1179 polymers. Additive temperature parameters, for the relationship giving the best fit to the data, are tabulated which enable predictions to be made of many polymer Tgs outside the data set. These parameters also provide a measure of the relative effectiveness of groups in internally plasticising polymers.