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RADIATION CHEMISTRY. (U)  
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1 of 3  
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**RADIATION CHEMISTRY**

**A DDC BIBLIOGRAPHY**

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**NOVEMBER 1977**

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This bibliography contains unclassified-unlimited citations on Radiation Chemistry; chemistry of radiation effects on organic, inorganic, and polymeric components. There is also a cross-section of references on instrumentation and techniques employed in measuring these reactions, and their rates. The four computer-generated indexes provided are Corporate Author-Monitoring Agency Subject, Title and Personal Author.		

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Item 19 KEY WORDS (Cont'd)

Plastics  
Water Chemistry  
Alkali Metal Compounds  
Electron Paramagnetic Resonance  
Crystal Structure  
Organic Sulfur Compounds  
Halogenated Hydrocarbons  
Test Methods  
Laboratory Equipment  
Electromagnetic Radiation  
Semiconductors  
Enzymes  
Rocket Propellants  
Complex Compounds  
Explosives  
Radiation Effects  
Aromatic Compounds  
Aliphatic Compounds

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NO. 11	of the Section <input type="checkbox"/>
NO. 12	of the Section <input type="checkbox"/>
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F O R E W O R D

This bibliography contains 194 unclassified-unlimited citations on *Radiation Chemistry*.

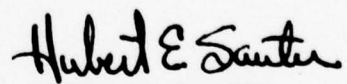
Entries have been selected from references processed into the Defense Documentation Center data bank from January 1960 to September 1977.

This report supersedes DDC report bibliography on *Radiation Chemistry*, AD-723 940, DDC-TAS-71-19-1, dated May 1971.

Individual entries are arranged in AD number sequence under the heading bibliographic references. Computer-generated indexes of Corporate Author-Monitoring Agency, Subject, Title and Personal Author are provided.

**BY ORDER OF THE DIRECTOR, DEFENSE LOGISTICS AGENCY**

**OFFICIAL**



**HUBERT E. SAUTER  
Administrator  
Defense Documentation Center**

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PERSONAL AUTHOR . . . . .	P-1

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 401 113  
DENVER RESEARCH INST COLO

BASIC STUDIES ON RADIATION ENERGY TRANSFER MECHANISMS  
OF CHEMICAL SYSTEMS (U)

DEC 62 1V BOHNER, GEORGE E. J  
CONTRACT: DA44 177TC725  
MONITOR: TRECOM 62-90

UNCLASSIFIED REPORT

DESCRIPTORS: \*ENERGY, \*ORGANIC COMPOUNDS, \*RADIATION  
CHEMISTRY, ADDITIVES, BENZENE (FUSED), BENZENE (IND),  
BENZENE (MONOSUBSTITUTED), BENZENE (POLY USAGE),  
CHEMICAL REACTIONS, CHROMATOGRAPHIC ANALYSIS,  
CYCLOALKANES (6M), CYCLOALKANES (IND), CYCLOALKANES  
(SATURATED), DECOMPOSITION, FREE RADICALS, INHIBITION,  
ORGANIC SOLVENTS, POLYMERIZATION, RADIATION EFFECTS,  
RINGS-2, THEORY (U)  
IDENTIFIERS: BENZENE (FUSED), BENZENE (IND), BENZENE  
(POLY USAGE), BENZENE (MONOSUBSTITUTED), CYCLOALKANES  
(IND), CYCLOALKANES (SATURATED), CYCLOALKANES (6M),  
RINGS-2 (M)

BENZENE, BIPHENYL, AND NEPHTHALENE WERE THE PRINCIPAL  
PROTECTIVE ADDITIVES STUDIED IN PROTECTING CYCLOHEXANE  
FROM DEGRADATION BY HIGHENERGY IRRADIATION; FREE RADICAL  
MECHANISM AND RADIOLYTIC DEGRADATION.

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 403 022

NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST

A RAPID RADIOCHEMICAL PROCEDURE FOR TIN, (U)

FFB 63 17P LOVE, AAND D.L.;  
REPT. NO. USNRDL-TR-632

UNCLASSIFIED REPORT

DESCRIPTORS: \*RADIATION CHEMISTRY, \*TIN, \*ISOTOPE SEPARATION, ISOTOPES, BOROHYDRIDES, SODIUM COMPOUNDS, ANTIMONY, TIN COMPOUNDS, HYDRIDES, ANTIMONY COMPOUNDS, DECONTAMINATION, FISSION PRODUCTS, ARSENIC, IODINE, TELLURIUM, TEST EQUIPMENT, HALF LIFE. (U)

A VERY RAPID RADIOCHEMICAL PROCEDURE HAS BEEN DEVELOPED FOR THE ISOLATION OF RADIOISOTOPES OF TIN FROM THEIR FISSION-PRODUCT ISOBARS. AN IR RADIATED URANIUM SOLUTION CONTAINING TIN AND ANTIMONY CARRIERS IS ADDED TO A SOLUTION OF SODIUM BOROHYDRIDE. THE VOLATILE STANNANE (SNH<sub>4</sub>) FORMED IS DECOMPOSED IN A HOT QUARTZ TUBE TO THE METAL, WHICH IS COLLECTED ON A COLD SURFACE. STIBINE (SBH<sub>3</sub>), WHICH IS ALSO FORMED UNDER THESE CONDITIONS, IS REMOVED BY ABSORPTION ON AN 'ASCARITE' COLUMN. THE TIN CHEMICAL YIELD RANGES BETWEEN 15% FOR AN SB DECONTAMINATION FACTOR OF 20,000 TO 60% FOR AN SB DECONTAMINATION FACTOR OF 1,000. THE TIME REQUIRED FOR SEPARATION OF THE TIN METAL FROM THE OTHER FISSION PRODUCT ELEMENTS IS ABOUT 10 SEC. DECONTAMINATION FACTORS OF OTHER SN DESCENDENTS ARE: I 70,000, AND TE > 20,000. ARSENIC IS ALSO VOLATILIZED AS THE HYDRIDE; HOWEVER, IT IS NOT NECESSARY TO ELIMINATE IT IN THIS WORK FOR THE DETERMINATION OF THE SN FISSION YIELD. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 415 654

FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

RADIATION-THERMAL CRACKING OF HYDROCARBONS, (U)

APR 63 1V TOPCHYEV, A. V. ; POLAK,  
L. S. ; CHERNYAK, N. YA. ; GLUSHNEV, V. YE. ;  
GLAZUNOV, P. YA. ;  
MONITOR: FTD TT62 1930

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. FROM RADIOSKTIVNIYE ISOTOPY I  
YADERNIYE IZLUCHENIYA V NARODNOM KHOZYAYSTVE SSSR, RIGA,  
PP. 206-210, 1960.

DESCRIPTORS: (\*ORGANIC COMPOUNDS, PROCES), (\*RADIATION  
CHEMISTRY, PROCESSING), (\*PRODUCTION, HYDROCARBONS,  
GAMMA RAYS, INDIUM ALLOYS, GALLIUM ALLOYS, POWDERS,  
RADIO, HYDROGEN, ALKANES, TEMPERATURE. (U)

RADIATION THERMAL CRACKING OF HYDROCARBONS. DEPENDENCE  
OF RADIATION CHEMICAL YIELD OF HYDROCARBONS ON RADIATION  
THERMAL CRACKING TEMPERATURE.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 417 705

GENERAL DYNAMICS/FORT WORTH TEX

ELECTRON-SPIN MAGNETIC RESONANCE OF FREE-RADICAL  
INTERMEDIATES IN GAMMA-IRRADIATED HYDROCARBONS, (U)

APR 63 93P STAPLES, J.A.;  
REPT. NO. NARF-63-4T, MR-N-299  
CONTRACT: AF33 657 7201

UNCLASSIFIED REPORT

DESCRIPTORS: (\*RADIATION CHEMISTRY, HYDRO),  
(\*HYDROCARBONS, RADIATION CHEMISTRY), FREE RADICALS,  
ELECTRONS, SPINNING(MOTION), RESONANCE, ALKENES, GAMMA  
RAYS, ISOTOPES, COBALT, TEST, WAXES, GAMMA RAY SPECTRA,  
THEORY, ATOMIC ENERGY LEVEL, TEST EQUIPMENT,  
TABLES(DATA), DATA. (U)  
IDENTIFIERS: DODECANE (U)

RESULTS OF A STUDY OF THE CHARACTER AND ORIGIN OF  
THE ELECTRON-SPIN MAGNETIC-RESONANCE SPECTRA OF  
GAMMA-IRRADIATED HYDROCARBON COMPOUNDS ARE PRESENTED.  
THE COMPOUNDS EXAMINED INCLUDE SELECTED ALKANES,  
ALKENES, ALKYNES, BRANCHED ALKANES, AND  
CYCLOPARAFFINS. ALL IRRADIATIONS AND RESONANCE  
MEASUREMENTS WERE PERFORMED AT 77 K. SPECTRAL  
ANALYSIS WAS DIRECTED TOWARD IDENTIFICATION OF THE  
CHEMICAL SPECIES RESPONSIBLE FOR THE OBSERVED  
HYPERFINE PATTERNS. STRUCTURAL INTERPRETATION  
REFINED TO FREE-RADICAL SPECIES RESULTING FROM  
CARBON-HYDROGEN AND CARBON-CARBON BOND SCISSION IN  
THE PARENT MOLECULE. THESE RESULTS ARE  
INCORPORATED INTO AN EVALUATION OF THE CURRENT STATUS  
OF FREE-RADICAL SPECTRA FROM IRRADIATED HYDROCARBONS.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 422 205

AEROJET-GENERAL NUCLEONICS SAN RAMON CALIF

SELECTED SYNTHESIS BY FISSION FRAGMENT RECOIL. (U)

DESCRIPTIVE NOTE: QUARTERLY PROGRESS REPT. NO. 1, 1  
JULY-30 SEP 63,  
OCT 63 14P  
REPT. NO. AN1048  
CONTRACT: AF04 611 90  
TASK: 314801

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*LIQUID ROCKET OXIDIZERS, SYNTHESIS  
(CHEMISTRY)), (\*RADIATION CHEMISTRY, LIQUID ROCKET  
OXIDIZERS), FISSION, FISSION PRODUCTS, NITROGEN  
COMPOUNDS, FLUORIDES, FLUORINE, DOSIMETERS,  
RADIOCHEMISTRY, OXIDES, DETERMINATION, FLUORINE  
COMPOUNDS (U)  
IDENTIFIERS: HYDRAZINE TETRAFLUORIDE (U)

A STUDY IS BEING CONDUCTED ON THE SYNTHESIS OF TWO  
HIGH-ENERGY LIQUID OXIDIZERS BY MEANS OF FISSION  
FRAGMENT RADIOLYSIS. IRRADIATION CAPSULES AND  
FISSILE FUEL WERE PROCURED AND CALIBRATION OF ENERGY  
DEPOSITION WAS BEGUN. MOST MATERIALS FOR THE  
IRRADIATIONS, INCLUDING NF<sub>3</sub> AND N<sub>2</sub>F<sub>4</sub>, WERE  
ORDERED AND RECEIVED. ONE IRRADIATION WAS  
CONDUCTED TO GAIN HANDLING AND ANALYTICAL EXPERIENCE.  
A METHOD IS TO BE DEVELOPED UNDER A SUBCONTRACT FOR  
DIRECT DETERMINATION OF FLUORINE. IT APPEARS THAT  
FEWER CALIBRATION IRRADIATIONS WILL BE REQUIRED THAN  
THE TEN ORIGINALLY ESTIMATED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 423 525

RESEARCH AND TECHNOLOGY DIV BOLLING AFB D C

ELECTRON SPIN RESONANCE (ESR) STUDY OF GAMMA  
IRRADIATED SOLID ACETONITRILE.

(U)

DESCRIPTIVE NOTE: REPT. FOR JAN-JUNE 63,

SFP 63 21P HARRAH, L. A. ; RONDEAU, R. E.

; ZAKANYCZ, S. ; HALE, D. ; DUNBAR, D. ;

PROJ: 7367

TASK: 736701

MONITOR: ASD TDR63 785

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON RESEARCH ON  
CHARACTERIZATION AND PROPERTIES OF MATERIALS.

DESCRIPTORS: (\*ORGANIC COMPOUNDS, RADIATION CHEMISTRY),  
(\*RADIATION CHEMISTRY, ORGANIC COMPOUNDS), ORGANIC  
NITROGEN COMPOUNDS, COBALT, RADIOACTIVE ISOTOPES,  
SOLIDS, GAMMA RAYS, FREE RADICALS, ELECTRONS,  
SPINNING(MOTION), RESONANCE, CHROMATOGRAPHIC ANALYSIS,  
MASS SPECTROSCOPY, MAGNETIC FIELDS, CALIBRATION,  
HYDROGEN, ALKANES, HYPERFINE STRUCTURE

(U)

IDENTIFIERS: ACETONITRILE, RADIOLYSIS,  
SUCCINONITRILE

(U)

THE SOLID PHASE COBALT-60 RADIOLYSIS OF  
ACETONITRILE WAS INVESTIGATED. FREE RADICALS  
PRODUCED DURING THE EXPOSURE TO GAMMA RAYS WERE  
STUDIED WITH AN ELECTRON-SPIN RESONANCE SPECTROMETER  
AND THE FINAL PRODUCTS WERE DETERMINED BY GAS  
CHROMATOGRAPHY AND MASS SPECTROMETRY. PREDOMINANT  
PRODUCTS ARE HYDROGEN, METHANE, AND SUCCINONITRILE.  
THE REACTION PATHS TO THESE PRODUCTS ARE INFERRED  
FROM, AND CONSISTENT WITH, THE ESR SPECTRA OF THE  
TRAPPED FREE RADICALS. (UTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 423 856

STANFORD RESEARCH INST MENLO PARK CALIF

THE ROLE OF IONS IN THE RADIOLYSIS OF ORGANIC LIQUIDS.

(U)

DESCRIPTIVE NOTE: PROGRESS REPT., 1 MAR 62-31 AUG 63,  
NOV 63 47P SAMUEL, A. H. ; GOLUB, M. A. ;

DANON, J. ;

CONTRACT: AF33 657 8205

PROJ: 7360

TASK: 736003

MONITOR: RTO TDR63 4133

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*ORGANIC COMPOUNDS, RADIATION CHEMISTRY),  
(\*RADIATION CHEMISTRY, ORGANIC COMPOUNDS), (\*IONS,  
RADIATION CHEMISTRY), SOLUTIONS (MIXTURES), ORGANIC  
SOLVENTS, TIN COMPOUNDS, CHLORIDES, GAMMA RAYS, ELECTRON  
BEAMS, MOLECULAR ISOMERISM, HYDROCARBONS, ALKENES,  
AROMATIC COMPOUNDS, BENZENE, POLYMERS, COPOLYMERIZATION,  
NUCLEAR MOLECULAR RESONANCE, SPECTRA (INFRARED) (U)  
IDENTIFIERS: POLYISOPRENE, SQUALENE, TOLUENE (U)

IRRADIATION TO  $3 \times 10$  TO THE 21ST POWER EV/G OF SOLUTIONS OF STANNIC CHLORIDE ( $\text{SnCl}_4$ ) IN TOLUENE AT 195 K BY 1-MEV ELECTRONS GAVE O- AND M- AND/OR P-CHLOROTOLUENE YIELDS (G, MOLECULES/100 EV) WHICH WERE UNAFFECTED BY CHANGES IN TEMPERATURE AND DOSE AND BY THE PRESENCE OF ETHYLENE AND NITRIC OXIDE, BUT ROSE WITH  $\text{SnCl}_4$  CONCENTRATION TO APPROACH A LIMITING TOTAL VALUE NEAR 0.2. WHEN ETHYLENE WAS PRESENT, G(TOTAL  $\text{C}_9\text{H}_{12}$ ) WAS NEAR 0.01. WHEN  $\text{CCl}_4$  WAS SUBSTITUTED FOR  $\text{SnCl}_4$ , A DIFFERENT PRODUCT PATTERN WAS FOUND. SQUALENE WAS IRRADIATED WITH CO-60 GAMMA RAYS AT ROOM TEMPERATURE AND WITH 1-MEV ELECTRONS AT 243 K. THE MAIN RADIATION -INDUCED EFFECTS, WITH THEIR G-VALUES AT ROOM TEMPERATURE, ARE LOSS OF UNSATURATION (4.6), CROSSLINKING (1.35), TRANS-CIS ISOMERIZATION (0.83), AND HYDROGEN EVOLUTION (0.58). MOST OF THE LOSS OF UNSATURATION IS ATTRIBUTED TO CYCLIZATION; IT OCCURS ONLY IN THE CROSSLINKED FRACTION. INCREASED YIELDS (ON THE BASIS OF ENERGY ABSORBED IN THE SOLUTE) WERE OBSERVED FOR THE CIS-TRANS ISOMERIZATION OF SQUALENE AND CIS- AND TRANS-POLYISOPRENE WHEN THESE WERE IRRADIATED IN BENZENE SOLUTION.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 428 142

TEMPLE UNIV PHILADELPHIA PA RESEARCH INST

(NO TITLE).

(U)

DESCRIPTIVE NOTE: QUARTERLY PROGRESS REPT. NO. 1, 1 OCT-  
31 DEC 63.

DEC 63 14P

CONTRACT: AF04 611 9555

PROJ: 3148

TASK: 3148 0 1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*RADIATION CHEMISTRY, SCIENTIFIC RESEARCH), (\*FREE RADICALS, SYNTHESIS (CHEMISTRY)), OXIDIZERS, OXYGEN COMPOUNDS, FLUORIDES, ATOMS, HYDROGEN, ELECTRICAL EQUIPMENT, GAMMA RAYS, PARAMAGNETIC RESONANCE, RADIATION EFFECTS (U)

THE EXISTENCE OF OF RADICALS HAS NOT YET BEEN PROVED. SINCE CERTAIN ELUSIVE OF-CONTAINING COMPOUNDS WOULD BE STRONG OXIDIZERS, IDENTIFICATION AND STUDY OF THESE RADICALS SHOULD ASSIST IN THE SYNTHESIS OF NEW OXIDIZERS. THE PURPOSE OF THIS RESEARCH IS TO PRODUCE, ISOLATE AND IDENTIFY THE OF., O2F. AND O3F. RADICALS. IT IS PLANNED TO PREPARE THESE RADICALS BY TWO METHODS: I. BOMBARDMENT OF OF2, O2F2, O3F2, AND O2BF4 WITH H ATOMS AT 77 K. OR LOWER. II. IRRADIATION OF THESE COMPOUNDS WITH CO60 GAMMA-RAYS AT 77 K. OR LOWER. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 428 970

AERONAUTICAL SYSTEMS DIV WRIGHT-PATTERSON AFB OHIO

RADIATION PHYSICS: ITS IMPACT ON INSTRUMENTATION,

(U)

SEP 63 18P BEAVIN, RUDY C. I  
MONITOR: ASD TDR63 697

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE 'ASD 1963  
SCIENCE AND ENGINEERING SYMPOSIUM', 18-19 SEP 63.

DESCRIPTORS: (\*RADIATION CHEMISTRY, INSTRUMENTATION),  
(\*PHYSICS, RADIATION CHEMISTRY), FLIGHT CONTROL SYSTEMS,  
LOW ALTITUDE, ALTIMETERS, FUEL METERS, FUELS,  
MEASUREMENT, EXPERIMENTAL DATA, THEORY, RADIATION  
MEASURING INSTRUMENTS, ANALYSIS, GAMMA RAYS, RADIOACTIVE  
ISOTOPES (U)

PRESENTED IS AN ARGUMENT FOR EXPLOITING RADIATION  
PHYSICS FOR THE SOLUTION OF PROBLEMS IN THE  
INSTRUMENTATION AREA. A BRIEF REVIEW IS GIVEN OF  
BASIC PHYSICS CONNECTED WITH RADIATION. SEVERAL  
PROBLEMS IN THE FLIGHT CONTROL AREA ARE STATED AND  
POSSIBLE SOLUTIONS PRESENTED USING RADIATION PHYSICS  
CONCEPTS. THREE OF THESE PROBLEMS, LOW ALTITUDE  
ALTIMETRY, HIGH ALTITUDE ALTIMETRY, AND FUEL MASS  
MEASUREMENT, ARE EXAMINED IN DETAIL AND EXPERIMENTAL  
AND ANALYTICAL RESULTS GIVEN. A PROGRAM PHILOSOPHY  
AND THE ESTABLISHMENT OF AN IN-HOUSE EXPERIMENTAL  
FACILITY FOR EXPLOITATION OF RADIATION PHYSICS ARE  
ALSO REPORTED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 429 156

AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD  
MASS

THE FERROUS-FERRIC DOSIMETER: A REVIEW. (U)

DEC 63 21P BURKE, EDWARD A. ;  
MONITOR: AFCRL 63 587

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*RADIATION MEASURING INSTRUMENTS,  
RADIATION CHEMISTRY), (\*RADIATION CHEMISTRY, RADIATION  
MEASURING INSTRUMENTS), IRON COMPOUNDS, SULFATES, IONS,  
AMMONIUM COMPOUNDS, CHEMICAL REACTIONS, RADIATION  
EFFECTS, OXIDATION, RADIOMETERS, SPECTROPHOTOMETERS (U)  
IDENTIFIERS: CHEMICAL DOSIMETERS, IRON SULFATE (U)

THE CHARACTERISTICS, PREPARATION, AND USE OF THE  
FERROUS-FERRIC DOSIMETER ARE REVIEWED IN DETAIL.  
THIS INCLUDES A DISCUSSION OF THE DOSE RANGE, DOSE  
RATE DEPENDENCE, ENERGY DEPENDENCE, AND TEMPERATURE  
EFFECTS. FOR PHOTONS WITH ENERGIES IN EXCESS OF 6  
KEV THE IRRADIATION YIELD MAY BE REPRESENTED BY THE  
EXPRESSION  $G = 15.61 - 15.43/E$ , WHERE E IS THE  
MEAN PHOTON ENERGY IN KEV AND G IS THE NUMBER OF  
FERROUS IONS OXIDIZED PER 100 EV OF ENERGY ABSORBED.  
SEVERAL METHODS OF MEASURING FERRIC ION  
CONCENTRATION ARE DESCRIBED, INCLUDING THE  
CONVENTIONAL SPECTROPHOTOMETRIC DETERMINATION OF  
FERRIC AND FERROUS ION AND THE VERY SENSITIVE  
RADIOMETRIC MEASUREMENT OF FERRIC ION. A CONCISE  
SUMMARY OF ALL THE INFORMATION NECESSARY FOR ROUTINE  
APPLICATION OF THIS DOSIMETER IS GIVEN AT THE END OF  
THE REPORT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 430 560

FRANKFORD ARSENAL PHILADELPHIA PA

RESEARCH CONDUCTED ON SECRETARY OF THE ARMY RESEARCH  
AND STUDY FELLOWSHIP IN THE GENERAL FIELD OF PHYSICAL  
ORGANIC CHEMISTRY, (U)

NOV 63 39P RADELL, J. ;  
REPT. NO. FA-R-1698

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*RADIATION CHEMISTRY, SCIENTIFIC  
RESEARCH), (\*COMPLEX COMPOUNDS, UREA), (\*ALKYNES,  
POLYMERIZATION), (\*POLYMERS, ALKYNES), GAMMA RAYS,  
AROMATIC COMPOUNDS, MOLECULAR ROTATION, OXYGEN  
HETEROCYCLIC COMPOUNDS, THIOLS, ESTERS, CARBOXYLIC  
ACIDS, BROMINE COMPOUNDS, IODINE COMPOUNDS, DOSIMETERS,  
SYNTHESIS (CHEMISTRY), OPTICAL PROPERTIES (U)  
IDENTIFIERS: INCLUSION COMPOUNDS (U)

A GENERAL REVIEW OF THE VARIOUS ACTIVITIES OF THE  
AUTHOR IN THE GENERAL FIELD OF PHYSICAL ORGANIC  
CHEMISTRY WHILE ON A SECRETARY OF THE ARMY  
RESEARCH AND STUDY FELLOWSHIP IS PRESENTED.  
SOME GENERAL OBSERVATIONS ARE GIVEN WHICH RESULTED  
FROM VISITS TO VARIOUS LABORATORIES IN ISRAEL AND  
WESTERN EUROPE. IN ADDITION, ALL THE  
PUBLISHED, PRESENTED, AND COMPLETED RESEARCH OF THE  
AUTHOR WHICH OCCURRED DURING THIS FELLOWSHIP PERIOD  
IS PRESENTED OR SUMMARIZED. THREE MAIN SUBJECTS  
WERE PURSUED; (1) EFFECT OF GAMMA RADIATION  
ON OPTICALLY ORGANIC COMPOUNDS; (2) UREA  
INCLUSION COMPOUNDS; AND (3) ENERGETIC  
ACETYLENIC COMPOUNDS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 434 046

NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF

RADICAL YIELDS IN IRRADIATED AROMATICS, (U)

JAN 64 33P MCANDREWS, J. I. ; ANDERSON,  
T. H. ; MARTIN, S. B. ;  
REPT. NO. USNRDL-TR-718  
PROJ: SRO11-01-01  
TASK: 0401

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*RADIATION CHEMISTRY, AROMATIC COMPOUNDS),  
(\*FREE RADICALS, CRYOGENICS), ALCOHOLS, BENZENE,  
BIPHENYL, ELECTRONS, SPINNING(MOTION), RESONANCE,  
CYCLOHEXENES, HYDROCARBONS (U)  
IDENTIFIERS: METHYL ALCOHOL, NAPHTHALENE, TOLUENE (U)

THE RELATIVELY HIGH EFFICIENCY OF PRODUCTION OF  
FREE RADICALS WHICH BECOME STABILIZED AT LIQUID  
NITROGEN TEMPERATURE DURING THE RADIOLYSIS OF SEVERAL  
AROMATIC HYDROCARBONS DEMONSTRATES THE QUANTITATIVE  
IMPORTANCE OF THESE INTERMEDIATES IN THE MECHANISM OF  
RADIATION DECOMPOSITION. THE REQUIRED MEASUREMENT  
OF G(R.) VALUES NECESSITATED THE INDIRECT  
APPROACH OF COMPARING PARTIALLY SATURATED ESR  
ABSORPTION SPECTRA AT HIGH POWERS AND THEN EVALUATING  
THE EXTENT OF SATURATION IN AN INDEPENDENT  
MEASUREMENT. G9R.0 VALUES ARE: BENZENE, 0.32;  
TOLUENE, 0.53; BIPHENYL AND NAPHTHALENE, 0.10. THE  
RESULTS AVERAGE ABOUT ONE-THIRD OF THE CORRESPONDING  
VALUES FOR RADIOLYSIS AT ROOM TEMPERATURE.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 455 623

NAVAL AIR ENGINEERING CENTER PHILADELPHIA PA AERONAUTICAL  
MATERIALS LAB

UTILIZATION OF GAMMA RADIATION TO ENHANCE PROPERTIES  
OF POLYMERS AND TO INITIATE POLYMERIZATION OF  
MONOMERS. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 1, 23 MAR-15 DEC  
64,

DEC 64 16P HARGREAVES, G. ; HOWERTON, W.  
W. ;

PROJ: NAEC-AML(36)-R360FR101

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*RADIATION CHEMISTRY, POLYMERS),  
(\*POLYMERS, RADIATION CHEMISTRY), (\*POLYMERIZATION,  
RADIATION CHEMISTRY), REVIEWS, SCIENTIFIC RESEARCH,  
GAMMA RAYS, MECHANICAL PROPERTIES, PHYSICAL PROPERTIES,  
DAMAGE, RADIATION EFFECTS, BIBLIOGRAPHIES, POLYETHYLENE  
PLASTICS, POLYVINYL CHLORIDE, HALOCARBON PLASTICS,  
SILICONE PLASTICS, LAMINATED PLASTICS, ACRYLIC RESINS,  
NYLON, STYRENE PLASTICS (U)

GAMMA RADIATION TO ENHANCE POLYMER PROPERTIES AND INITIATE  
POLYMERIZATION OF MONOMERS.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 455 716

ATOMIC ENERGY OF CANADA LTD CHALK RIVER (ONTARIO)

ENERGY TRANSFER IN THE RADIOLYSIS OF CYCLOPENTANE-  
CYCLOHEXANE MIXTURES, (U)

64 8P STONE, J. A. ;

.. 2081

UNCLASSIFIED REPORT

REPRINT FROM JNL. OF CHEMISTRY, 42, PP. 2872-2879,  
1964. (COPIES NOT SUPPLIED BY DDC)  
SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*RADIATION CHEMISTRY, CYCLOHEXANES),  
(\*CYCLOPENTANES, RADIATION CHEMISTRY), (\*CYCLOHEXANES,  
MIXTURES), ENERGY, DEUTERIUM COMPOUNDS, FREE RADICALS,  
EXCHANGE REACTIONS, HYDROGEN, MOLECULAR ASSOCIATION,  
INHIBITION, IODINE, CARBON TETRACHLORIDE (U)

ENERGY TRANSFER IN THE RADIOLYSIS OF CYCLOPENTANE-  
CYCLOHEXANE MIXTURES HAS BEEN STUDIED BY OBSERVING  
THE YIELDS OF HD AND D2 OBTAINED WHEN SMALL  
AMOUNTS OF CYCLOHEXANE D12 ARE ADDED. ENERGY  
MIGRATION OCCURS FROM CYCLOPENTANE TO CYCLOHEXANE BUT  
THIS TRANSFER CAN BE PREVENTED BY THE ADDITION OF  
CARBON TETRACHLORIDE OR IODINE. THE RELATIVE  
YIELDS OF THE DIMERS (C6H11)2,  
C5H9C6H11, AND (C5H9)2 SHOW THAT THE  
C6H11 AND C5H9 RADICALS, WHICH ARE THE  
PRECURSORS OF THE DIMERS, CAN ABSTRACT HYDROGEN ATOMS  
FROM THE SOLVENT AND MAY THUS CHANGE THEIR IDENTITY.  
ADDED IODINE OR CARBON TETRACHLORIDE REMOVES THE  
DIFFUSING RADICALS, AND THE RESIDUAL DIMER YIELD,  
WHICH IS UNAFFECTED BY SOLUTE, HAS A COMPOSITION  
DETERMINED SOLELY BY THE COMPOSITION OF THE MIXTURES.  
THE YIELDS OF CYCLOHEXENE AND CYCLOPENTENE SHOW  
EVIDENCE OF BOTH ENERGY TRANSFER AND RADICAL CHANGE  
OF IDENTITY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 461 232

PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

MECHANISM OF THE SHIELDING EFFECT OF AROMATIC AMINES  
DURING RADIOLYSIS OF POLYMERS. SENSITIZED FORMATION  
OF AMINE-ION RADICALS. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.,

APR 65 9P BAGDASAR'YAN, KH. S. ;  
KRONGAUZ, V. A. ; KARDASH, N. S. ;  
MONITOR: PA TM-1483

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. FROM DOKLADY AKADEMII  
NAUK SSSR, 144:1, PP. 101-104, 1962.

DESCRIPTORS: (\*RADIATION CHEMISTRY, AMINES), (\*ACRYLIC  
RESINS, RADIATION CHEMISTRY), (\*AMINES, RADIATION  
CHEMISTRY), AROMATIC COMPOUNDS, POLYMERS, GAMMA RAYS,  
RADIOPROTECTIVE AGENTS, SHIELDING, FREE RADICALS,  
ABSORPTION SPECTRA, HYDRAZINES, REACTION KINETICS, US(U)  
IDENTIFIERS: DIPHENYLPICRYLHYDRAZYL (U)

THE SHIELDING EFFECT OF AROMATIC AMINES ON THE  
RADIATION DESTRUCTION OF POLYMETHYLMETHACRYLATE WAS  
INVESTIGATED. THE ANTI-RADIATION EFFECT OF BETA-  
NAPHTHYLAMINE, PHENYL-BETA-NAPHTHYLAMINE,  
DIPHENYLAMINE, AND TRIPHENYLAMINE WAS ALSO  
INVESTIGATED. THE EFFECT OF DIPHENYLPICRYLHYDRAZYL  
(DPPH) ON THE DESTRUCTION OF POLYMETHYLMETHACRYLATE  
WAS INVESTIGATED ALSO. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 463 911

NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF

THE RADIOLYTIC DECOMPOSITION OF MONOMETHYLHYDRAZINE  
ROCKET FUEL, (U)

APR 65 18P SHELBERG, W. E. †

REPT. NO. USNRDL-TR-843

PROJ: SR011 01 01

TASK: 0401

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*METHYL HYDRAZINES, DECOMPOSITION),  
(\*DECOMPOSITION, METHYL HYDRAZINES), (\*RADIATION  
CHEMISTRY, METHYL HYDRAZINES), LIQUID ROCKET FUELS,  
RADIATION EFFECTS, SIMULATION, GAMMA RAYS, SPACE  
ENVIRONMENTS, ADITIVES, FREE RADICALS, REACTION  
KINETICS, ALKENES, ACRYLIC RESINS, CARBON TETRACHLORIDE,  
STORAGE, STABILITY (U)  
IDENTIFIERS: SCAVENGERS (U)

INVESTIGATIONS WERE MADE OF THE POSSIBILITY OF  
SUPPRESSING THE GENERATION OF NONCONDENSABLE GASES  
WHEN MONOMETHYLHYDRAZINE (MMH) ROCKET FUEL IS  
SUBJECTED TO IONIZING RADIATION. MMH PRODUCES MORE  
THAN TWICE ITS VOLUME OF GAS (MEASURED AT 25 C  
AND 1 ATM.) CONSISTING OF HYDROGEN, NITROGEN AND  
METHANE WHEN IRRADIATED TO NEARLY 10 TO THE 7TH POWER  
RADS WITH GAMMA RAYS. AN ATTEMPT AT GAS  
SUPPRESSION WAS MADE WITH CHEMICAL ADDITIVES THAT  
COULD RENDER FREERADICALS IMPOTENT BY REACTING WITH  
THEM. TWO NORMALLY EFFICIENT OLEFINIC ADDITIVES  
(FREERADICAL SCAVENGERS) FAILED TO SUPPRESS GAS  
EVOLUTION, THEREBY DEMONSTRATING THAT MMH DOES NOT  
DECOMPOSE RADIOLYTICALLY VIA FREE-RADICAL  
INTERMEDIATES. INSTEAD, IT DECOMPOSES VIA A  
MOLECULAR OR IONIC PROCESS. THE ADDITION OF CARBON  
TETRACHLORIDE AS A POTENTIAL, GASSUPPRESSING ADDITIVE  
ACTUALLY INCREASED GAS EVOLUTION ENORMOUSLY, AND THIS  
IS EXPLAINABLE ON THE BASIS THAT IT INITIATES A  
CHEMICAL CHAIN REACTION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 481 674 7/3 7/5  
AKRON UNIV OHIO INST OF POLYMER SCIENCE

LOW TEMPERATURE POLYMERIZATION. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 1, 3 JAN-31 MAR  
66,

APR 66 21P MORTON, MAURICE ;  
CONTRACT: AF 04(611)-11378  
PROJ: AFSC-3148

UNCLASSIFIED REPORT

DESCRIPTORS: (\*POLYMERIZATION, LOW TEMPERATURE),  
(\*RADIATION CHEMISTRY, POLYMERIZATION), POLYMERS,  
FLUORINE COMPOUNDS, ALDEHYDES, METALORGANIC COMPOUNDS,  
ALKENES, IONS, SENSITIVITY, ATTENUATION, LITHIUM,  
PROPAGATION, SOLUTIONS(MIXTURES), GAMMA RAYS,  
LEAD(METAL), SHIELDING, PROPENES, MANAGEMENT PLANNING  
AND CONTROL, ACRYLONITRILE POLYMERS (U)  
IDENTIFIERS: ACETALDEHYDE/TRIFLUORO, BUTENES, ETHYL  
LITHIUM (U)

DURING THIS PERIOD WORK CONTINUED ON THE  
POLYMERIZATION OF TRIFLUOROACETALDEHYDE (FLUORAL)  
WITH ATTENTION BEING DIRECTED TO TWO ASPECTS OF THE  
REACTION, THE DOSE-RATE DEPENDENCE OF THE RADIATION  
INITIATED REACTION, AND THE POLYMERIZATION INITIATED  
BY ETHYL LITHIUM. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 601 493

BATTELLE MEMORIAL INST COLUMBUS OHIO RADIATION EFFECTS  
INFORMATION CENTER

THE BENEFICIAL USES OF RADIATION EFFECTS. (U)

JUN 64 27P DRENNAN, J. E. ; HAMMAN, D. J.  
; WYLER, E. N. ;  
REPT. NO. M25  
CONTRACT: AF33 615 1124

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*NUCLEAR PARTICLES, POWER), (\*RADIATION  
CHEMISTRY, ILLUMINATION), (\*RADIOTHERAPY, RADIATION  
EFFECTS), TRACER STUDIES, RADIOACTIVE ISOTOPES,  
MEASURING INSTRUMENTS (U)

THE REPORT PRESENTS INFORMATION RELATIVE TO THE  
BENEFICIAL USES OF RADIATION EFFECTS. ALTHOUGH  
MANY STUDIES OF RADIATION EFFECTS HAVE BEEN  
CONDUCTED, MOST OF THE RESULTS REPORTED DISCUSS HOW  
THE DEVICE TESTED WAS DAMAGED OR DEGRADED BY THE  
RADIATION EXPOSURE. THE PREVIOUS LITERATURE HAS  
IMPLIED THAT THE RADIATION ENVIRONMENT IS MALIGNANT.  
THIS REPORT IS WRITTEN UNDER THE CONCEPT THAT ANY  
ENVIRONMENT WILL CAUSE CHANGES TO OCCUR IN A DEVICE,  
MATERIAL, OR STRUCTURE, AND THAT THE CHANGES SEEN  
WHEN THE ENVIRONMENT CONTAINS SIGNIFICANT AMOUNTS OF  
THE RADIATION ENERGIES ARE BENEFICIAL OR MALIGNANT  
DEPENDING ONLY ON THE PRECONCEIVED OBJECTIVES OF THE  
OBSERVER. THE REPORT SUMMARIZES BENEFICIAL USES OF  
THE PENETRATING ABILITIES OF THE RADIATION ENERGIES,  
THE USE OF RADIATION ENERGIES TO PROVIDE  
ILLUMINATION, THE EXPLOITATION OF THESE ENERGIES AS A  
SOURCE OF USEFUL POWER, AND THE USE OF THE RADIATION  
ENERGIES TO CHANGE MATERIALS AND THUS MAKE NEW OR  
IMPROVED PRODUCTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 602 163

BATTELLE MEMORIAL INST COLUMBUS OHIO RADIATION EFFECTS  
INFORMATION CENTER

MONTHLY ACCESSION LIST. ABSTRACT NO. 24313 TO 24385,  
PART I. (U)

DESCRIPTIVE NOTE: REPT. FOR 1-30 JUN 64,  
JUL 64 30P

REPT. NO: MAL76

CONTRACT: AF33 615 1124 ,AF33 657 10085

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*RADIATION CHEMISTRY, MATERIALS),  
(\*BIBLIOGRAPHIES, RADIATION CHEMISTRY), ABSTRACTS,  
METALS, CERAMIC MATERIALS, ORGANIC MATERIALS, POLYMERS,  
ELECTRONIC EQUIPMENT, SINGLE CRYSTALS, INORGANIC  
COMPOUNDS, DAMAGE, RADIATION EFFECTS, OSCILLATORS,  
ACCELEROMETERS, NUCLEAR REACTORS, HANDBOOKS, SPACE  
ENVIRONMENTS, RADIATION MEASURING INSTRUMENTS (U)  
IDENTIFIERS: TRANSIENT RADIATION  
EFFECTS(ELECTRONICS) (M)

A BIBLIOGRAPHY OF 73 ABSTRACTS IS GIVEN ON THE  
EFFECTS OF RADIATION ON METALLIC, CERAMIC, ORGANIC,  
POLYMERIC, AND INORGANIC MATERIALS; ELECTRONIC  
MATERIALS, COMPONENTS, AND DEVICES; TEST FACILITIES;  
SPACE ENVIRONMENT AND EFFECTS ON MATERIALS; AND  
EXPERIMENTAL DEVICES AND TECHNIQUES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 602 164

BATTELLE MEMORIAL INST COLUMBUS OHIO RADIATION EFFECTS  
INFORMATION CENTER

MONTHLY ACCESSION LIST. COORDINATE INDEX, PART II,  
FOR ACCESSION LISTS FROM OCTOBER 1, 1963 TO JUNE 30,  
1964. (U)

JUL 64 16P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*INDEXES, RADIATION CHEMISTRY),  
(\*RADIATION CHEMISTRY, MATERIALS), SUBJECT INDEXING,  
ABSTRACTS, NUCLEAR PARTICLES, DOSIMETERS, SPACE  
ENVIRONMENTS, ENVIRONMENT (U)

THE INVERTED CONCEPT-COORDINATE INDEX IS A  
REFERENCE FOR THE MONTHLY ACCESSION LIST (AD-  
602 163). THE INDEX IS SUBDIVIDED INTO SECTIONS.  
THE FIRST, RADIATION ENVIRONMENT, INCLUDES  
DOSIMETRY AND ENERGY ASPECTS OF ALL ELECTROMAGNETIC  
AND PARTICULATE RADIATION SOURCES, WITH THE EXCEPTION  
OF SPACE RADIATION. SECTION TWO DEALS WITH  
MATERIALS, PROPERTIES, SECONDARY ENVIRONMENT  
(INCLUDING SPACE ENVIRONMENTS), DEVICES, AND ALL  
OTHER SUBJECT CONCEPTS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 602 600

FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OH.0

MECHANISM OF DIRECT ACTION OF RADIATION ON PERCHLORIC  
U.C. ACID, (U)

JAN 64 12P BUGAENKO, L. T. ;  
REPT. NO. FTD-MT-63-194

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED MACHINE TRANS. OF MOVO.  
VSESOUZNOE SOVESHCHANIE PO RADIATIONNOI KHIMI'  
(ALL-UNION CONFERENCE ON RADIATION CHEMISTRY)  
(NO. 2) MOSCOW 1960 . TRUDY, MOSCOW, 1962, P.  
144-148. .

DESCRIPTORS: (\*RADIATION CHEMISTRY, PERCHLORIC ACID),  
(\*PERCHLORIC ACID, RADIATION CHEMISTRY), PERCHLORATES,  
PERCHLORYL RADICALS, REDUCTION (CHEMISTRY), X-RAYS,  
IONS, IRON, ETHANOLS, ACETONES, REACTION KINETICS, US(U)

RESULTS ARE GIVEN OF STUDIES ON THE EFFECTS OF  
BIVALENT FE, ETHANOL, AND ACETONE ON THE REDUCTION  
OF PERCHLORATE IONS IN THE PRESENCE OF X-RADIATION. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 603 605

AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO

RADIOLYSIS OF PROPANE AT LOW CONVERSION. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,

AUG 64 66P BLOCKER, NORMAN KEITH ;  
MONITOR: AFIT , GNE/PHYS/64 2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*ALIPHATIC COMPOUNDS, RADIATION CHEMISTRY), (\*RADIATION CHEMISTRY, ALIPHATIC COMPOUNDS), HYDROCARBONS, PURIFICATION, DECOMPOSITION, CHROMATOGRAPHIC ANALYSIS, ALKENES, SYNTHESIS (CHEMISTRY), PARTICLE ACCELERATORS (U)

LOW CONVERSION STUDIES OF THE RADIOLYSIS OF PROPANE WERE PERFORMED BY THE USE OF A TECHNIQUE WHICH WAS DEVELOPED TO SATISFY THE STRINGENT REQUIREMENTS OF PURITY AND TRACE ANALYSIS CAPABILITY. THE CALCULATED G VALUE FOR ETHANE IN THE LOW CONVERSION REGION WAS 1.95. ALL OTHER PRODUCT YIELDS WERE DETERMINED RELATIVE TO THIS VALUE. SIGNIFICANT INCREASES IN YIELDS FOR PROPYLENE AND ETHYLENE WERE OBSERVED AS THE DEGREE OF CONVERSION WAS DECREASED FROM 2.6 TO 0.0045 PER CENT. THESE INCREASES WERE ATTRIBUTED TO THE ABSENCE OF INTERNAL SCAVENGING REACTIONS INVOLVING HYDROGEN ATOM ATTACK ON THESE PRODUCTS. A DECREASE IN THE YIELD OF 2,3 DIMETHYLBUTANE WAS ACCOMPANIED BY AN INCREASE IN THE YIELDS OF METHANE AND ETHANE AS THE CONVERSION WAS INCREASED FROM 0.05 TO 1.00 PER CENT. IT WAS CONCLUDED THAT THE INITIAL YIELDS FOR THE RADIOLYSIS PRODUCTS WERE REPRESENTED BY THE PRODUCT YIELD, AT THE LOWEST DEGREE OF CONVERSION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 605 430

ARMY ELECTRONICS LABS FORT MONMOUTH N J

EFFECTS OF IONIZING RADIATION ON PYRIDINE, (U)

JUL 64 8P PEARCE, CAROL K. ;

REPT. NO. TR-2485

PROJ: DA-1-A-010501-B-010

TASK: 1-A-010501-B-01026

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*PYRIDINES, RADIATION CHEMISTRY),  
(\*RADIATION CHEMISTRY, PYRIDINES), LIQUIDS,  
DECOMPOSITION, POLYMERIZATION, GASES, HYDROGEN,  
POLYMERS, ELECTRONIC EQUIPMENT (U)  
IDENTIFIERS: ACETYLENES (U)

IRRADIATION OF LIQUID PYRIDINE WAS FOUND TO PRODUCE  
POLYPYRIDINES, AND HYDROGEN AND ACETYLENE GASES. A  
MECHANISM IS PRESENTED TO EXPLAIN THE PRODUCTS AND  
YIELDS OBSERVED. SOME CONCLUSIONS RELATED TO THE  
USE OF PYRIDINE COMPOUNDS FOR ELECTRONIC DEVICES ARE  
DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 605 457

JOHNSTON (WILLIAM H) LABS INC BALTIMORE MD

BASIC STUDIES IN QUANTUM AND RADIATION  
CHEMISTRY.

(U)

DESCRIPTIVE NOTE: REPT. FOR DEC 61-JUN 64,  
JUN 64 129P VESTAL, MARVIN ; KRAUSE, M ;  
JOHNSTON, WM. H. ;  
CONTRACT: AF33 616 7678  
PROJ: AF-7360  
TASK: 736003  
MONITOR: AFML TDR64 169

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*RADIATION CHEMISTRY, QUANTUM THEORY),  
(\*QUANTUM THEORY, RADIATION CHEMISTRY), GAS IONIZATION,  
PHOTONS, ELECTRONS, X-RAYS, ATOMIC ORBITALS, MASS  
SPECTROSCOPY, ALIPHATIC COMPOUNDS, ALCOHOLS, AMINES,  
SILANES, HYDROGEN COMPOUNDS, SULFIDES, HYDROCHLORIC  
ACID, ARGON, METHANE, AMMONIA, WATER VAPOR, NEON,  
THIOLS, HALOGENATED HYDROCARBONS, KRYPTON CARBON  
TETRACHLORIDE, XENON, MERCURY, BUTANES, OXYGEN,  
NITROGEN

(U)

THE PRIMARY INTERACTIONS OF HIGH ENERGY PHOTONS AND  
ELECTRONS WITH MATTER IN THE GAS PHASE WERE STUDIED.  
THE EXPERIMENTAL STUDIES INCLUDED MEASUREMENTS OF  
THE MASS/CHARGE SPECTRA PRODUCED BOTH BY X-RAY  
IONIZATION AND BY HIGH ENERGY ELECTRON IONIZATION, AS  
WELL AS SECONDARY ELECTRON ENERGY MEASUREMENTS FOR  
BOTH X-RAY AND ELECTRON IONIZATION. THE MOLECULES  
STUDIED WERE THE FOLLOWING: PROPANE, ETHANOL,  
ETHYLAMINE, SILANE, HYDROGEN SULFIDE, HYDROGEN  
CHLORIDE, ARGON, METHANE, AMMONIA, WATER, NEON, ETHYL  
SILANE, ETHANETHIOL, ETHYL CHLORIDE, METHYL CHLORIDE,  
METHYL BROMIDE, ETHYL BROMIDE, HYDROGEN BROMIDE,  
KRYPTON, METHYL IODIDE, ETHYL IODIDE, CARBON  
TETRACHLORIDE, XENON, MERCURY, DIMETHYLAMINE, 1, 3-  
BUTADIENE, N-BUTANE, 2-BUTYNE, OXYGEN AND NITROGEN.  
THE DATA OBTAINED IN THESE INVESTIGATIONS ARE THE  
FIRST COMPREHENSIVE MEASUREMENTS OF INNER SHELL  
IONIZATION BY X-RAYS IN WHICH THE RESULTING MASS/  
CHARGE SPECTRA WERE MEASURED IN A MASS SPECTROMETER.  
THE THEORETICAL INTERPRETATION AND A SEMIEMPIRICAL  
CORRELATION OF THE EXPERIMENTAL DATA ARE DISCUSSED.  
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 609 440  
AMERICAN OIL CO WHITING IND

THE RADIATION CHEMISTRY OF ACETYLENIC COMPOUNDS. (U)

DESCRIPTIVE NOTE: REPT. FOR 30 NOV 62-31 JUL 64,  
NOV 64 30P RONDEAU, R. E. ; HARRAH, L. A.  
; NEVITT, T. D. ; BARBER, H. H., JR. ; SCHAFFER, R.

CONTRACT: AF33 616 8247  
PROJ: AF-7367  
TASK: 736701  
MONITOR: AFML TR-64-353

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*ALIPHATIC COMPOUNDS, RADIATION  
CHEMISTRY), (\*RADIATION CHEMISTRY, ALIPHATIC COMPOUNDS),  
DECOMPOSITION, POLYMERIZATION, FREE RADICALS, AROMATIC  
COMPOUNDS, NITRILES, CHROMATOGRAPHIC ANALYSIS (U)  
IDENTIFIERS: ACETYLENE/ETHYL, CROTONYLENE, HEXYNES,  
PROPYNE (U)

THE DISTRIBUTION OF PRODUCTS FROM THE RADIOLYSIS OF  
BUTYNE-2, PROPYNE, PENTYNE-2, HEXYNE-3 AND BUTYNE-1  
ARE GIVEN. DIMERS, TRIMERS AND TETRAMERS, OF  
EMPIRICAL FORMULAE  $C_nH_{2n}$ ,  $C_nH_{2n-2}$  AND  
 $C_nH_{2n-4}$ , ARE FORMED IN THE FOLLOWING RELATIVE  
CONCENTRATION: (DIMERS) >> (TRIMERS) >>  
(TETRAMERS). A GENERAL MECHANISM ON THE BASIS OF  
FREE RADICAL REACTIONS IS INVOKED TO ACCOUNT FOR THIS  
DISTRIBUTION. IN ADDITION, AROMATIC PRODUCTS ARE  
ALSO FORMED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 610 038

AKRON UNIV OHIO INST OF RUBBER RESEARCH

LOW TEMPERATURE POLYMERIZATION STUDIES. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 4, L OCT-31 DEC  
64,

JAN 65 15P MORTON, MAURICE ;

CONTRACT: AF04 611 9694

PROJ: 3148

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*POLYMERIZATION, RADIATION CHEMISTRY),  
(\*RADIATION CHEMISTRY, POLYMERIZATION), (\*LOW  
TEMPERATURE, POLYMERIZATION), ACRYLONITRILE POLYMERS,  
VINYL PLASTICS, FLUORIDES, CHLORIDES, SOLVENTS,  
PURIFICATION, GAMMA RAYS, HALOCARBON PLASTICS (U)  
IDENTIFIERS: ACETONE/HEXAFLUORO, CHLORAL, CYANIDE/  
ALLYL (U)

THE REPORT CONTAINS RESULTS ON THE POLYMERIZATION  
OR ATTEMPTED POLYMERIZATION OF THE FOLLOWING MONOMERS  
BY GAMMA RADIATION AT REDUCED TEMPERATURES:  
ACRYLONITRILE, VINYL FLUORIDE, VINYL CHLORIDE, ALLYL  
CYANIDE, CHLORAL, AND HEXAFLUOROACETONE. SINCE THE  
LAST REPORTING PERIOD, WORK HAS CONTINUED TO  
DETERMINE THE CAUSES OF THE ERRATIC RATES OBTAINED IN  
THE RADIATION-INDUCED POLYMERIZATION OF ACRYLONITRILE  
AT -74C AND 720,000 RADS PER HOUR. IN ADDITION,  
THE GAMMA RAY INITIATED POLYMERIZATION OF VINYLIDENE  
FLUORIDE, VINYL FLUORIDE, VINYL CHLORIDE AND 3-BUTENE  
NITRILE (ALLYL CYANIDE) AT -72 TO -74C HAS BEEN  
EXAMINED. NEW WORK WAS ALSO STARTED ON THE  
RADIATION-INITIATED POLYMERIZATION OF CARBONYL  
COMPOUNDS. THE TWO MONOMERS THUR FAR STUDIED WERE  
CHLORAL AND HEXAFLUORO-ACETONE. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 610 557  
ROCK ISLAND ARSENAL ILL

RADIATION AND OZONE INITIATED GRAFT  
COPOLYMERIZATION.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
OCT 64 16P MCGARVEY, J. W. ;  
REPT. NO. RIA-64-3009  
PROJ: 1C0 24401A110

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*ELASTOMERS, SYNTHESIS (CHEMISTRY)),  
(\*COPOLYMERIZATION, CATALYSIS), (\*RADIATION CHEMISTRY,  
COPOLYMERIZATION), (\*OZONE, COPOLYMERIZATION),  
VULCANIZATES, VINYL PLASTICS, BUTYL RUBBER,  
ACRYLONITRILE POLYMERS, SILICONE PLASTICS, VULCANIZAT(U)  
IDENTIFIERS: DICHLORO ETHYLENES, GRAFT POLYMERS (U)

RADIATION AND OZONE INITIATED GRAFT  
COPOLYMERIZATION REACTIONS WERE INVESTIGATED FOR THE  
SYNTHESIS OF NEW TECHNOLOGICALLY USEFUL ELASTOMERS.  
SIGNIFICANT GRAFTING WAS OBSERVED FOR MANY OF THE  
VARIOUS COMBINATIONS OF MONOMERS AND POLYMERS  
INVESTIGATED. RADIATION INITIATED VINYLIDENE  
CHLORIDE-SBR AND OZONE INITIATED ACRYLONITRILE SBR  
GRAFT COPOLYMERS ARE OF PARTICULAR INTEREST SINCE  
THEY EXHIBIT IMPROVED OIL RESISTANCE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 611 561

GENERAL DYNAMICS/FORT WORTH TEX NUCLEAR AEROSPACE RESEARCH FACILITY

EFFECT OF ENVIRONMENTAL HYDROGEN PRESSURE ON THE HYDROGEN YIELD FROM XIRRADIATED POLYETHYLENES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. FOR 1 OCT 63-30 SEP 64,

JAN 65 36P HILL, O. H. ; LIGHTFOOT, R. P. ;  
REPT. NO. FZK-203  
CONTRACT: AF29 601 6213  
PROJ: AF-6773  
TASK: 677302  
MONITOR: AFWL TR-64-150

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: AVAILABLE COPY WILL NOT PERMIT FULLY LEGIBLE REPRODUCTION. REPRODUCTION WILL BE MADE IF REQUESTED BY USERS OF DDC. COPY IS AVAILABLE FOR PUBLIC SALE.

DESCRIPTORS: (\*POLYETHYLENE PLASTICS, RADIATION CHEMISTRY), (\*RADIATION CHEMISTRY, POLYETHYLENE PLASTICS), X-RAYS, DECOMPOSITION, GASES, HYDROGEN, REACTION KINETICS, TEST EQUIPMENT, TEST METHODS, PRESSURE, MONITORS (U)

AN EXPERIMENTAL ASSEMBLY INCORPORATING A CAPACITANCE TYPE, DIFFERENTIAL PRESSURE TRANSDUCER, WHICH PROVIDES RESOLUTIONS OF 0.3 MICRON AT PRESSURES EXTENDING TO 30 MM, HAS BEEN EMPLOYED TO MONITOR THE EFFECT OF HYDROGEN ENVIRONMENTAL PRESSURE ON THE HYDROGEN YIELD FROM XIRRADIATED POLYETHYLENES. CONTRARY TO THE OBSERVATIONS OF PREVIOUS RESEARCHERS, THE HYDROGEN YIELD IS FOUND TO BE INDEPENDENT OF HYDROGEN ENVIRONMENTAL PRESSURES EXTENDING UP TO AT LEAST 30 MM HG. IT IS DEMONSTRATED THAT NEGLECTING THE TEMPERATURE AND DENSITY GRADIENTS INHERENT IN CLOSED-VOLUME IRRADIATION ASSEMBLIES EMPLOYING CRYOGENIC TRAPS TO SEPARATE LIBERATED GASES INTO CONDENSABLE AND NONCONDENSABLE FRACTIONS MAY LEAD TO ERRONEOUS CONCLUSIONS WITH RESPECT TO GAS YIELDS ARISING FROM THE IRRADIATION OF MATERIALS. TOTAL VOLATILE G-VALUES OF 3.6, 3.8, AND 4.0 MOLECULES PER 100 EV WERE OBTAINED FOR MARLEX 6002, DOW ZIEGLER (Q 917.5), AND DUPONT A-1410 POLYETHYLENES, RESPECTIVELY, WITH HYDROGEN CONTRIBUTIONS OF APPROXIMATELY 98 MOLE PERCENT. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 611 575  
GENERAL DYNAMICS/FORT WORTH TEX

X-RADIATION-INDUCED UNSATURATION CHANGES IN MARLEX  
6002 POLYETHYLENE. (U)

DESCRIPTIVE NOTE: REPT. FOR 1 OCT 63-30 SEP 64,  
JAN 65 48P HILL, O. H. ALBRECHT, T. W. ;  
REPT. NO. FZK-204  
CONTRACT: AF29 601 6213  
PROJ: AF-6773  
TASK: 677302  
MONITOR: AFWL TR-64-147

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*POLYETHYLENE PLASTICS, RADIATION  
CHEMISTRY), (\*RADIATION CHEMISTRY, POLYETHYLENE  
PLASTICS), DECOMPOSITION, GASES, MONITORS, INFRARED  
SPECTROPHOTOMETERS, INFRARED SPECTROSCOPY, REACTION  
KINETICS, HYDROGEN, PRESSURE (U)

AN IRRADIATION-DEWAR ASSEMBLY WAS DESIGNED FOR USE  
WITH AN INFRARED SPECTROPHOTOMETER SO THAT SELECTED  
ORGANICS COULD BE INTERMITTENTLY MONITORED DURING  
X-IRRADIATION WITH MAXIMUM ENVIRONMENTAL AND  
TEMPERATURE INTEGRITY OF THE SAMPLE. THIS ASSEMBLY  
WAS EMPLOYED TO STUDY THE TEMPERATURE DEPENDENCE OF  
THE RATES OF CHANGE OF UNSATURATION IN MARLEX 6002  
POLYETHYLENE. THE INITIAL RATE OF RADIATION-  
INDUCED TRANS-VINYLENE FORMATION IN MARLEX 6002  
POLYETHYLENE IS FOUND TO BE  $2.0 \pm 0.3$  BONDS PER 100  
EV AND INDEPENDENT OF TEMPERATURE OVER THE RANGE OF  
FROM 105 TO 300K, WHILE VINYL DECAY EXTRAPOLATED TO  
ZERO RADIATION DOSE OVER THE SAME RANGE SATISFIES  
 $G(-VI) = 5.8 \exp(341(1/300 - 1/T))$ ,  
WITH  $G(-VI)$  REPRESENTING THE NUMBER OF VINYL  
BONDS DISAPPEARING PER 100 EV ABSORBED AT ABSOLUTE  
TEMPERATURE T(K). THE PROCESS OF TRANSVINYLENE  
ELIMINATION HAS BEEN OBSERVED QUALITATIVELY TO BE  
TEMPERATURE-DEPENDENT OVER THIS TEMPERATURE RANGE.  
A 1-ATM PRESSURE OF HYDROGEN DOES NOT CHANGE  
UNSATURATION RATES. THE TECHNIQUES EMPLOYED HAVE  
CERTAIN ADVANTAGES IN FUNDAMENTAL RADIATION CHEMISTRY  
STUDIES. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 611 779

PENNSYLVANIA STATE UNIV UNIVERSITY PARK

AN EPR INVESTIGATION OF RADIATION PROTECTION BY  
AROMATIC ADDITIVES IN SYNTHETIC POLYMERS. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,  
DEC 64 75P BANASZAK, JEROME J. ;  
CONTRACT: AF33 608 954

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*PLASTICS, ADDITIVES), (\*ACRYLIC RESINS,  
DAMAGE), (\*POLYMERS, DAMAGE), (\*RADIATION CHEMISTRY,  
POLYMERS), (\*NUCLEAR MAGNETIC RESONANCE, POLYMERS), X-  
RAYS, GAMMA RAYS, FREE RADICALS, ELECTRONS, NUCLEAR  
SPINS, PARAMAGNETIC RESONANCE, MICROWAVE SPECTROSCOPY,  
AROMATIC COMPOUNDS, SALICYLATES, BENZOATES, RESORCINOL,  
PHOSPHORIC ACIDS, XYLENES, (U)XYLENES (U)

THE RESEARCH IS A STUDY OF THE PROTECTIVE EFFECTS  
AGAINST IONIZING RADIATION THAT AROMATIC COMPOUNDS  
PROVIDE WHEN ADDED TO A SYNTHETIC POLYMER IN VARIOUS  
PROPORTIONS. SINCE RADIATION DAMAGE IN HIGH  
POLYMER COMPOUNDS IS USUALLY ACCOMPANIED BY THE  
PRODUCTION OF FREE RADICALS IN THE MATERIAL, ELECTRON  
PARAMAGNETIC RESONANCE (EPR) TECHNIQUES WERE  
UTILIZED TO MEASURE THE EXTENT OF THE FREE RADICAL  
CONCENTRATION. COMPARATIVE MEASUREMENTS WERE MADE  
OF THE RADIATION-PROTECTIVE EFFECTS OF DIFFERENT  
AROMATIC ADDITIVES ON POLYMETHYL METHACRYLATE.  
DATA OBTAINED FROM THE EPR SPECTRA WAS CORRELATED  
WITH SOME OF THE THEORIES CURRENTLY ADVANCED RELATING  
FREE RADICAL FORMATION, DEGRADATION AND CROSSLINKING  
DURING POLYMER IRRADIATION. DEGRADATION OR  
MULTIPLE CHAIN SCISSION, IS DEFINED AS THE BREAKING  
UP OF THE LONG MOLECULAR CHAINS IN A POLYMER INTO  
SMALLER UNITS, WHEREAS CROSSLINKING IS USUALLY  
ASSOCIATED WITH INCREASING THE NUMBER OF LATERAL  
LINKAGES BETWEEN POLYMER CHAINS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 613 305  
CALIFORNIA UNIV LOS ANGELES

CHEMISTRY OF POSITIVE IONS. I. GENERAL THEORY  
PARTICULARLY FOR THE RADIATION INDUCED CROSS LINKAGE  
OF POLYMERS AND POLYMERIZATION OF SATURATED  
HYDROCARBONS. (U)

61 30P LIBBY, W. F. ;  
CONTRACT: AF49 638 901  
MONITOR: AFOSR , 563

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*RADIATION CHEMISTRY, IONS), (\*IONS,  
RADIATION CHEMISTRY), (\*POLYMERS, RADIATION CHEMISTRY),  
(\*HYDROCARBONS, POLYMERIZATION), (\*POLYETHYLENE  
PLASTICS, RADIATION CHEMISTRY), FREE RADICALS, THEORY,  
ALIPHATIC COMPOUNDS, REACTION KINETICS, IONIZATION  
POTENTIALS, THERMOCHEMISTRY, DECOMPOSITION, HEAT OF  
ACTIVATION, CHEMICAL BONDS, PHASE STUDIES (U)

THE CHEMICAL PROPERTIES OF POSITIVE IONS ARE  
CONSIDERED TO BE ANALOGOUS TO THOSE OF THE  
CORRESPONDING NEUTRAL ATOM OR MOLECULE EXCEPT THAT  
THE CHARGE STRENGTHENS BONDS AND PROVIDES THE LONG  
RANGED ATTRACTIVE POLARIZATION FORCE WHICH CAUSES THE  
REACTION CROSS SECTIONS TO BE VERY LARGE. FOR  
ORGANIC IONS DEHYDROGENATION TO FORM CARBONIUM IONS  
OCCURS FREQUENTLY SO IN ADDITION TO THE PARENT ION  
RADICAL WITH ITS GREAT REACTIVITY AS A TYPE OF SUPER  
FLUORINE ATOM THE CARBONIUM IONS WITH THEIR EXTREMELY  
ACIDIC (ELECTROPHILIC) PROPERTIES CAUSE A WHOLLY  
DIFFERENT SET OF REACTIONS ANALOGOUS TO THOSE OF  
CARBENE AND LEADING TO THE PREDICTION OF RADIATION  
INDUCED POLYMERIZATION OF SATURATED ALIPHATIC  
HYDROCARBONS. BOTH ION RADICALS AND CARBONIUM IONS  
CAN PLAY IMPORTANT ROLES IN THE RADIATION INDUCED  
CROSS LINKAGE OF POLYETHYLENE AND OTHER POLYMERS.  
IT IS PREDICTED THAT THE EFFECT OF PHASE WILL BE  
VERY IMPORTANT IN RADIATION CHEMISTRY BECAUSE THE  
CAGE EFFECT OF THE SURROUNDING CLOSE PACKED MOLECULES  
IN THE LIQUID AND SOLID PHASE AS CONTRASTED WITH THE  
GAS PHASE WILL CAUSE THE FRAGMENTATION OF THE PARENT  
IONS WHICH IS SO MARKED IN THE GAS PHASE TO BE  
REVERSED TO A CONSIDERABLE EXTENT AND PROMOTE THE  
FORMATION OF LARGE MOLECULES, PARTICULARLY POLYMERS.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 613 529

AKRON UNIV OHIO INST OF RUBBER RESEARCH

LOW TEMPERATURE POLYMERIZATION STUDIES. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 5, 1 JAN-31 MAR  
65,

APR 65 30P MORTON, MAURICE ;

CONTRACT: AF04 611 9694

PROJ: 3148

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-610 038.

DESCRIPTORS: (\*POLYMERIZATION, RADIATION CHEMISTRY),  
(\*RADIATION CHEMISTRY, POLYMERIZATION),  
(\*THERMOCHEMISTRY, POLYMERIZATION), LOW TEMPERATURE,  
ACRYLONITRILE POLYMERS, VINYL PLASTICS, HALOCARBON  
PLASTICS, ALDEHYDES, KETONES, NITRILES,  
COPOLYMERIZATION, GAMMA RAYS, BIBLIOGRAPHIES (U)  
IDENTIFIERS: PROPYLENE HEXAFLUORIDE (U)

THE REPORT CONTAINS RESULTS ON THE POLYMERIZATION  
OR ATTEMPTED POLYMERIZATION OF THE FOLLOWING MONOMERS  
BY GAMMA RADIATION (7.6 RADS/HR.) AT REDUCED  
TEMPERATURES: ACRYLONITRILE, HEXAFLUOROPROPYLENE,  
FUMARONITRILE, HEXAFLUOROACETONE,  
TRIFLUOROACETALDEHYDE, PERFLUOROOCETANAL, AND  
PENTAFLUOROPROPIONALDEHYDE. A COMPREHENSIVE  
BIBLIOGRAPHY ON THE GAMMA IRRADIATION OF POTENTIAL  
MONOMERS WAS ALMOST COMPLETED, AND A PRELIMINARY  
LISTING IS INCLUDED. IN ADDITION, A DIFFERENTIAL  
THERMAL ANALYSIS ASSEMBLY WAS CONSTRUCTED FOR USE  
DURING POLYMERIZATION BY GAMMA RADIATION OF  
ACRYLONITRILE. THE RESULTS QUALITATIVELY INDICATE  
THAT POLYMERIZATION OCCURS ONLY IN THE TEMPERATURE  
VICINITY OF A PHASE TRANSITION. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 614 731

RESEARCH TRIANGLE INST DURHAM N C

PREPARATION AND CHARACTERIZATION OF SOME CELLULOSE  
GRAFT COPOLYMERS. PART III. THE ROLE OF CONCURRENT  
DEGRADATION DURING RADIATION GRAFTING,

(U)

JUN 64 11P WELLONS, J. D. ; STANNETT, V. ;  
MONITOR: AROD , 3630:8

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN JOURNAL OF POLYMER  
SCIENCE: PART A V3 P847-57 1965 (COPIES NOT  
AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (\*CELLULOSE ACETATES, RADIATION CHEMISTRY),  
(\*COPOLYMERIZATION, RADIATION CHEMISTRY), (\*RADIATION  
CHEMISTRY, COPOLYMERIZATION), DECOMPOSITION, ORGANIC  
SOLVENTS, PYRIDINES, AROMATIC COMPOUNDS, FILMS, STYRENE  
PLASTICS, POLYETHYLENE PLASTICS (U)  
IDENTIFIERS: GRAFT POLYMERS (U)

THE RADIATION DEGRADATION OF CELLULOSE ACETATE WAS  
STUDIED BOTH IN THE DRY STATE AND IN SOLUTION. THE  
RATE OF DEGRADATION WAS GREATER IN THE SOLID STATE  
AND WAS UNAFFECTED BY OXYGEN. CONJUGATED SOLVENTS  
SUCH AS PYRIDINE, TOLUENE, AND ALPHA-METHYLSTYRENE  
WERE SHOWN TO EXERT CONSIDERABLE PROTECTION AGAINST  
THE RADIATION DEGRADATION OF CELLULOSE ACETATE WHEN  
IN SOLUTION OR AS SWOLLEN FILMS.

ALPHAMETHYLSTYRENE WAS USED AS A MODEL FOR STYRENE  
TO STUDY THE AMOUNT OF DEGRADATION ACCOMPANYING THE  
GRAFTING PROCESS. MATCHING EXPERIMENTS WERE CARRIED  
OUT BY USING BOTH THE MUTUAL AND PREIRRADIATION  
METHODS OF GRAFTING. CONSIDERABLY GREATER CHAIN  
CLEAVAGE WAS FOUND TO ACCOMPANY THE GRAFTING IN THE  
PREIRRADIATION CASE. WITH BOTH METHODS THE NUMBER  
OF CHAIN CLEAVAGES WAS MEASURED WHEN ALPHA-  
METHYLSTYRENE WAS PRESENT IN THE 'GRAFTING' SOLUTION  
AND THE NUMBER OF GRAFTED SIDE CHAINS WHEN STYRENE  
WAS USED. IT WAS SHOWN THAT AT LEAST TWICE AS MANY  
GRAFTED CHAINS AS CLEAVAGES OCCUR WITH THE MUTUAL  
TECHNIQUE, BUT IN THE CASE OF PREIRRADIATION THE  
NUMBER OF CLEAVAGES IS COMPARABLE TO THE NUMBER OF  
GRAFTED CHAINS. IN GENERAL, IT CAN BE SAID THAT IN  
EVERY CASE AT LEAST 50% OF THE GRAFT COPOLYMERS ARE  
SIDE-CHAIN GRAFTS; THIS FIGURE IS PROBABLY  
CONSIDERABLY HIGHER IN THE CASE OF THE MUTUAL  
RADIATION PREPARATIONS. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 614 984

BATTELLE MEMORIAL INST COLUMBUS OHIO RADIATION EFFECTS  
INFORMATION CENTER

MONTHLY ACCESSION LIST COORDINATE INDEX, PART  
II.

(U)

DESCRIPTIVE NOTE: REPT. FOR 1 OCT 64-30 APR 65,  
MAY 65 13P

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SUPPLEMENTARY NOTE: AVAILABLE COPY WILL NOT PERMIT FULLY  
LEGIBLE REPRODUCTION. REPRODUCTION WILL BE MADE IF  
REQUESTED BY USERS OF DDC. COPY IS NOT AVAILABLE FOR  
PUBLIC SALE.

DESCRIPTORS: (\*DAMAGE, INDEXES), (\*INDEXES, RADIATION  
CHEMISTRY), (\*RADIATION CHEMISTRY, MATERIALS),  
(\*ELECTROMAGNETIC RADIATION, DEGRADATION), SUBJECT  
INDEXING, ALPHA PARTICLES, DEUTERONS, ELECTRONS,  
NEUTRONS, IONS, PROTONS, GAMMA RAYS, X RAYS, PHOTONS,  
ELECTROMAGNETIC PULSES, ULTRAVIOLET RADIATION,  
(U)ULTRAVIOLET RADIATION

(U)

THE INVERTED CONCEPT-COORDINATE INDEX IS A  
REFERENCE FOR THE MONTHLY ACCESSION LIST (AD-  
614 985). THE INDEX IS SUBDIVIDED INTO SECTIONS.  
THE FIRST, RADIATION ENVIRONMENT, INCLUDES  
DOSIMETRY AND ENERGY ASPECTS OF ALL ELECTROMAGNETIC  
AND PARTICULATE RADIATION SOURCES, WITH THE EXCEPTION  
OF SPACE RADIATION. SECTION TWO DEALS WITH  
MATERIALS, PROPERTIES, SECONDARY ENVIRONMENT  
(INCLUDING SPACE ENVIRONMENTS), DEVICES, AND ALL  
OTHER SUBJECT CONCEPTS.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 615 602

NAVAL RESEARCH LAB WASHINGTON D C

CHEMONUCLEAR SYNTHESIS OF NITROGENFLUORINE  
COMPOUNDS.

(U)

DESCRIPTIVE NOTE: INTERIM REPT.,

APR 65 14P HAZLETT, R. N. ;

REPT. NO. NRL-6239

PROJ: RR010 01 44 5851

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*ROCKET PROPELLANTS, SYNTHESIS  
(CHEMISTRY)), (\*NITROGEN COMPOUNDS, FLUORIDES),  
(\*FLUORIDES, RADIATION CHEMISTRY), (\*RADIATION  
CHEMISTRY, ROCKET PROPELLANTS), URANIUM COMPOUNDS,  
FISSION PRODUCTS, NITROGEN, FLUORINE, THERMAL NEUTRONS,  
AZINES (U)

IDENTIFIERS: NITROGEN FLUORIDES, URANIUM(VI)  
FLUORIDE (U)

MIXTURES OF NITROGEN AND FLUORINE CONTAINING  
URANIUM-235 AS URANIUM HEXAFLUORIDE WERE EXPOSED TO  
THE RADIATION FIELD OF A NUCLEAR REACTOR. THE  
FISSION FRAGMENTS FORMED BY REACTION OF U(235)  
WITH THE THERMAL NEUTRON COMPONENT OF THE REACTOR  
RADIATION CAUSED THE FORMATION OF NITROGEN FLUORIDES.  
THOSE IDENTIFIED WERE NITROGEN TRIFLUORIDE,  
CISDIFLUORODIAZINE, AND TRANS-DIFLUORODIAZINE.  
NITROGEN TRIFLUORIDE IS THE MAJOR PRODUCT, AND THE  
AMOUNT FORMED IS DEPENDENT UPON THE TOTAL ENERGY  
DEPOSITED. THE OTHER TWO PRODUCTS ARE IN  
EQUILIBRIUM WITH EACH OTHER, AND THE AMOUNT FORMED  
DECREASES AS THE RADIATION INTENSITY INCREASES. THE  
TOTAL G VALUE FOR COMPOUND FORMATION IS LESS THAN 1  
MOLECULE PER 100 ELECTRON VOLTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 615 704

ARMED FORCES INST OF PATHOLOGY WASHINGTON D C

BEHAVIOR OF UNSATURATED FATTY ACIDS IN THE  
THIOBARBITURIC ACID TEST AFTER RADIOLYSIS, (U)

SEP 64 15P SASLAW, L. D. ;WARAVDEKAR, V.  
S. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN RADIATION RESEARCH V24 N3  
P375-89 MAR 1965 (COPIES NOT AVAILABLE TO DDC OR  
CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (\*FATTY ACIDS, RADIATION CHEMISTRY),  
(\*RADIATION CHEMISTRY, FATTY ACIDS), BARBITURATES,  
ACIDS, CHEMICAL ANALYSIS, LINOLENIC ACID, LINOLEIC ACID,  
ULTRAVIOLET RADIATION, GAMMA RAYS, CHEMICAL INDICATORS, (U)  
BIOCHEMISTRY (U)  
IDENTIFIERS: OLEIC ACID (U)

IRRADIATION OF LINOLENIC ACID AND ARACHIDONIC ACID  
RESULTS IN PRODUCTION OF SEVERAL CHROMATOGRAPHICALLY  
DISTINGUISHABLE THIOBARBITURIC ACID (TBA)-ACTIVE  
COMPOUNDS. THE ULTRAVIOLET RADIATION-INDUCED  
OXIDATION OF THE FATTY ACIDS IS ALSO CHARACTERIZED BY  
INCREASED ABSORPTION AT 225 MILLIMICRONS AND A  
POSITIVE BENZIDINE TEST. CHROMATOGRAPHICALLY  
DIFFERENT TBA-ACTIVE PRODUCTS WERE OBTAINED,  
DEPENDING ON THE RADIATION AND THE SUBSTRATE  
EMPLOYED. DESPITE THE SIMILARITY OF CHROMOGEN  
SOLUTIONS OBTAINED FROM THE TBA-ACTIVE PRODUCTS TO  
THAT OBTAINED FROM MALONALDEHYDE, THE PRESENCE OF  
MALONALDEHYDE AMONG THE PRODUCTS AFTER EITHER PROCESS  
OF IRRADIATION WAS NOT EVIDENT. AFTER RESOLUTION  
OF THE TBA-ACTIVE PRODUCTS ON THIN-LAYER  
CHROMATOPLATES, THE TBA-ACTIVE SITES WERE OBSERVED  
TO REACT WITH BENZIDINE BUT DID NOT LIBERATE IODINE  
FROM POTASSIUM IODIDE. IN EACH IRRADIATION  
PROCESS, THE PRODUCTION OF TAB-ACTIVE COMPOUNDS WAS  
ACCOMPANIED BY PEROXIDE FORMATION. HOWEVER, THE  
TBA-ACTIVE COMPOUNDS ARE NOT OF A PEROXIDE NATURE.  
INASMUCH AS THE TBAACTIVE COMPOUNDS REACT WITH  
STANDARD REAGENTS FOR DETECTION OF THE CARBONYL  
FUNCTION, THE TBA TEST MUST BE REGARDED AS A TEST  
FOR UNIDENTIFIED CARBONYL COMPOUNDS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 615 983

FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

RADIATION POLYMERIZATION ON N-HEPTENE IN PRESENCE OF  
TiCl<sub>4</sub>, (U)

MAY 65 11P KOLBANOVSKII, YU. A. ; POLAK, L.  
S. ; SHLIKHTER, E. B. ;  
REPT. NO. FTD-TT-65-31  
MONITOR: TT , 65-62409

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF  
NEFTEKHIMIYA (USSR) V3 N2 P222-6 1963. AVAILABLE COPY  
WILL NOT PERMIT FULLY LEGIBLE REPRODUCTION.

DESCRIPTORS: (\*ALKENES, POLYMERIZATION), (\*RADIATION  
CHEMISTRY, ALKENES), TITANIUM COMPOUNDS, CHLORIDES,  
CATALYSTS, USSR (U)  
IDENTIFIERS: TITANIUM(IV) CHLORIDE (U)

RADIATION POLYMERIZATION OF N-HEPTENE-1 WAS  
INVESTIGATED IN PRESENCE OF TiCl<sub>4</sub>, AS WELL AS THE  
EFFECT OF DOSAGE, DOSAGE POWER AND RADIATION  
TEMPERATURE, AMOUNT OF CATALYST AND DILUTION ON THE  
YIELD OF THE POLYMER. IT WAS SHOWN, THAT IN  
DILUTED SOLUTIONS AND AT LOWER TEMPERATURES, OPTIMUM  
CONDITIONS FOR POLYMERIZATION WITH TiCl<sub>4</sub> ARE  
CREATED. WHEN CALCULATING ENERGY ABSORBED BY  
MONOMER ONLY, THE VALUES OF RADIATION-CHEMICAL YIELD  
CONSTITUTE APPROX. 50 MOL/100 EV. IT WAS  
ESTABLISHED THAT THE POLYMER YIELD DEPENDS UPON  
DOSAGE POWER IN DEGREE 0.8. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 616 958

AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

RARE GAS SENSITIZED RADIOLYSIS OF ACETYLENE, (U)

SFP 64 9P FUTRELL, J. H. ; SIECK, L. W. ;  
REPT. NO. ARL 65-101

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN JOURNAL OF PHYSICAL CHEMISTRY V69 P892-900 1965 (COPIES NOT AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS). PRESENTED AT THE ANNUAL MEETING OF THE RADIATION RESEARCH SOCIETY (12TH) MIAMI BEACH, FLA., MAY 17-20, 1964.

DESCRIPTORS: (\*ALIPHATIC COMPOUNDS, RADIATION CHEMISTRY), (\*RADIATION CHEMISTRY, POLYMERIZATION), (\*RARE GASES, ALIPHATIC COMPOUNDS), POLYMERS, NEON, IONIZATION (U)  
IDENTIFIERS: ACETYLENES (U)

THE GAS PHASE RADIOLYSIS OF ACETYLENE HAS BEEN INVESTIGATED IN THE PRESENCE AND ABSENCE OF VARIOUS SENSITIZERS AT VARIOUS DOSE RATES. THE POLYMERIZATION REACTIONS HAVE BEEN CORRELATED WITH HIGH-PRESSURE, MASS SPECTROMETRIC STUDIES OF MIXTURES WITH RARE GASES, WITH THE CONCLUSION THAT THE PRECURSORS FOR POLYMER PROPAGATION DO NOT DEPEND UPON CHARGE EXCHANGE (IONIZATION OF ACETYLENE). A QUANTITATIVE INVESTIGATION OF BENZENE PRODUCTION AND SENSITIZATION INDICATES THAT NEON IS UNIQUE AMONG THE NOBLE GASES IN THAT IT ALONE ENHANCES THE FORMATION. THE INITIAL INTERACTION,  $Ne(+) + C_2H_2$  TO  $C_2H(+) + H + Ne$ , OBSERVED MASS SPECTROMETRICALLY IS RESPONSIBLE. VARIOUS PHOTOLYSIS AND RADIOLYSIS EXPERIMENTS INVOLVING ARGON-DEUTERIUM-ACETYLENE AND DEUTERIUM-ACETYLENE MIXTURES HAVE DEFINED THE MECHANISM FOR THE INCREASE IN  $G(C_6H_6)$  OBSERVED IN THIS WORK AND IN PREVIOUS STUDIES AT LOWER DOSE RATES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 617 025

MCMASTER UNIV HAMILTON (ONTARIO)

RADIATION-INDUCED GRAFT POLYMERIZATION OF STYRENE IN WOOD, (U)

64 15P RAMALINGAM, K. V. ; WEREZAK, G. N.  
; HODGINS, J. W. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN JOURNAL OF POLYMER SCIENCE: PT C N2 P153-67 1963. (COPIES NOT AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (\*POLYMERIZATION, RADIATION CHEMISTRY), (\*WOOD, PLASTICIZERS), (\*PLASLICIZERS, COPOLYMERIZATION), (\*RADIATION CHEMISTRY, POLYMERIZATION), STYRENE PLASTICS, CELLULOSE, GAMMA RAYS, IMPREGNATION, PHYSICAL PROPERTIES, PARAMAGNETIC RESONANCE, SPECTROSCOPY, FREE RADICALS, FEASIBILITY STUDIES (U)  
IDENTIFIERS: GRAFT POLYMERIZATION (U)

GRAFTING OF POLYSTYRENE TO THE CELLULOSE IN RED PINE SAPWOOD HAS BEEN ACCOMPLISHED BY GAMMA IRRADIATION OF THE TERNARY SOLUTION OF STYRENE, METHANOL, AND WATER. THE RESULTING MATERIAL POSSESSES SUBSTANTIALLY ENHANCED BENDING STRENGTH AND DIMENSIONAL STABILITY. OPTIMUM CONDITIONS HAVE BEEN DETERMINED BY A FACTORIAL EXPERIMENTAL DESIGN. ELECTRON SPIN RESONANCE STUDIES HAVE REVEALED TWO DISTINCT TYPES OF LONG-LIVED FREE RADICALS, ONE OF WHICH IS THE SPECIFIC PRECURSOR FOR THE GRAFTING REACTION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 617 580

ALBERTA UNIV EDMONTON DEPT OF CHEMISTRY

RADIOLYSIS OF CYCLOHEXANE. V. PURIFIED LIQUID  
CYCLOHEXANE AND SOLUTIONS OF ADDITIVES,

(U)

FEB 64 9P HO, S. K. ; FREEMAN, G. R. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN JOURNAL OF PHYSICAL  
CHEMISTRY V68 N8 P2189-97 AUG 1964 (COPIES NOT  
AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (\*CYCLOHEXANES, RADIATION CHEMISTRY),  
(\*RADIATION CHEMISTRY, CYCLOHEXANES), GAMMA RAYS,  
CHEMICAL REACTIONS, HYDROGEN, CYCLOHEXANES, ALIPHATIC  
COMPOUNDS, HYDROCARBONS, FREE RADICALS, OXYGEN, QUINO(U)

THE INITIAL PRODUCT YIELDS (G VALUES) IN THE  
GAMMARADIOLYSIS OF HIGHLY PURIFIED LIQUID CYCLOHEXANE  
HAVE BEEN FOUND TO BE: HYDROGEN 5.6 = 0.1;  
CYCLOHEXENE 3.2 = 0.2; 1-HEXENE 0.40 = 0.05; N-  
HEXANE 0.08 = 0.02; METHYLCYCLOPENTANE 0.15 =  
0.01; ETHYLCYCLOHEXANE APPROXIMATELY 0.04;  
DICYCLOHEXYL 1.76 = 0.05; CYCLOHEXYLHEXENE 0.12 =  
0.02; UNIDENTIFIED C(12) APPROXIMATELY 0.05.  
CYCLOHEXYLCYCLOHEXENE WAS A SECONDARY PRODUCT.  
BOTH OXYGEN AND P-BENZOQUINONE REDUCED THE MAJOR  
LIQUID PRODUCT YIELDS TO THE SAME LIMITING VALUES:  
CYCLOHEXENE 1.5 = 0.1; 1-HEXENE 0.27 = 0.03;  
DICYCLOHEXYL 0.29 = 0.03. FROM THE REDUCTION IN  
THE YIELDS OF THESE PRODUCTS, AND ON THE ASSUMPTION  
THAT FREE RADICALS WERE BEING SCAVENGED BY THE  
ADDITIVES, A LOWER LIMIT OF 1.1 = 0.3 WAS OBTAINED  
FOR THE RATIO OF THE RATE CONSTANTS  
K(DISPROPORTIONATION)/ K(COMBINATION) FOR  
CYCLOHEXYL RADICALS IN LIQUID CYCLOHEXANE.  
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 618 155

AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

THE RADIOLYSIS OF PROPANE AT EXTREMELY LOW  
CONVERSIONS,

(U)

SEP 64 7P SIECK, L. W. ; BLOCKER, N. K. ;  
FUTRELL, J. H. ;  
REPT. NO. ARL-65-102

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE ANNUAL MEETING OF  
THE RADIATION RESEARCH SOCIETY (12TH), MIAMI  
BEACH, FLA. MAY 17-20, 1964. PUB. IN JOURNAL OF  
PHYSICAL CHEMISTRY V69 P888-92 1965 (COPIES NOT  
AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (\*ALIPHATIC COMPOUNDS, RADIATION  
CHEMISTRY), (\*RADIATION CHEMISTRY, ALIPHATIC COMPOUNDS),  
VAPORS, DECOMPOSITION, DISPROPORTIONATION, REACTION  
KINETICS, IONS, FREE RADICALS (U)

THE GAS PHASE RADIOLYSIS OF PROPANE WAS  
INVESTIGATED AT EXTREMELY LOW CONVERSIONS IN ORDER TO  
DETERMINE INITIAL G VALUES. YIELDS OF  
UNSATURATED PRODUCTS ARE FOUND TO BE SIGNIFICANTLY  
HIGHER THAN THOSE OBTAINED IN THE PRESENCE OF ADDED  
SCAVENGERS, AND THE DIFFERENCES CAN BE CORRELATED  
WITH RADICAL-DISPROPORTIONATION REACTIONS. DOSE  
DEPENDENCE IS DISCUSSED IN SOME DETAIL AND POSSIBLE  
EXPLANATIONS FOR THE VARIATIONS IN YIELD ARE OFFERED.  
ALTHOUGH NO DETAILED MECHANISM IS ADVANCED, THE  
QUANTITATIVE YIELD DATA UPON WHICH THE MECHANISM MUST  
REST ARE PRESENTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 621 022

AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF  
ENGINEERING

RADIOLYSIS OF SOLID ETHYL IODIDE.

(U)

DESCRIPTIVE NOTE: MASTER'S THESIS,

AUG 65 71P HERMANN, GORDON L. ;

REPT. NO. GNE/PH/65-9

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*RADIATION CHEMISTRY, HALOGENATED  
HYDROCARBONS), (\*HALOGENATED HYDROCARBONS, DEGRADATION),  
(\*IODIDES, RADIATION CHEMISTRY), NUCLEAR MAGNETIC  
RESONANCE, LINE SPECTRA, FREE RADICALS, CRYSTAL  
LATTICES, MASS SPECTRA, PHASE STUDIES, DISSOCIATION,  
MOLECULAR ASSOCIATION (U)

IDENTIFIERS: ETHYL IODIDE (U)

A STUDY OF THE INTERACTION OF COBALT-60 RADIATION  
WITH FROZEN ETHYL IODIDE IN BOTH THE GLASS AND  
POLYCRYSTALLINE STATES. THE FINAL REACTION  
PRODUCTS OF THE RADIOLYSIS WERE MEASURED AND COMPARED  
WITH THE INTERMEDIATE REACTION SPECIES THAT WERE  
OBSERVED WITH AN ELECTRON SPIN RESONANCE  
SPECTROMETER. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 621 719

AMERICAN OIL CO WHITING IND

THE RADIATION CHEMISTRY OF ACETYLENIC COMPOUNDS. (U)

DESCRIPTIVE NOTE: FINAL REPT. FOR 1 DEC 61-1 MAY 65,

JUL 65 35P RONDEAU, R. E. ; HARRAH, L. A. ;

CONTRACT: AF33 616 8247

PROJ: AF-7360

TASK: 736003

MONITOR: AFML TR-65-236

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*ALIPHATIC COMPOUNDS, RADIATION CHEMISTRY), (\*RADIATION CHEMISTRY, ALIPHATIC COMPOUNDS), NITRILES, CHEMISTRY BONDS, CYANIDES, GAS ANALYSIS, CHROMATOGRAPHIC ANALYSIS, HYDROCARBONS, REACTION KINETICS (U)

IDENTIFIERS: ACETYLENE/ETHYL, ACETYLENE DERIVATIVES, ALKYL RADICALS, COUPLING AGENTS, CROTONYLENE, DIOLEFINS, LIQUID PHASE, PROPYNE, RADIOLYSIS, RECOMBINATION, VAPOR PHASES (M)

G-VALUES FOR RADIOLYSIS PRODUCTS WERE DETERMINED FOR PROPYNE AND BUTYNE-1 IN THE VAPOR PHASE AND FOR BUTYNE-1, BUTYNE-2, PENTYNE-1, PENTYNE-2, HEXYNE-3, ACETONITRILE AND PROPIONITRILE IN THE LIQUID PHASE. THE RUPTURE OF A C-H BOND PROBABLY FROM A CARBON BETA TO THE TRIPLE BOND RESULTS IN H<sub>2</sub>, COUPLING PRODUCTS, AND H ATOM ADDITION. H ATOM ADDITION LEADS TO MONO AND POLY OLEFINS. THE RUPTURE OF A C-C BOND RESULTS IN FRAGMENTATION IN THE VAPOR PHASE BUT RECOMBINATION TO FORM 1,2-DIOLEFINS IN LIQUID PHASE. BOTH ALPHA AND BETA C-C BOND RUPTURE OCCUR. ALKYL BENZENE--ALKYNE TRIMERS--FORM, PROBABLY BY EXCITATION. ANALOGOUS C<sub>3</sub>N<sub>3</sub> RING COMPOUNDS MAY FORM BUT WERE NOT DETECTED. GAS CHROMATOGRAPHY TECHNIQUES FOR ALKYNE AND NITRILE ANALYSES ARE DESCRIBED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 623 095

NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF

THE RADIATION-INDUCED DECOMPOSITION OF MILLIMOLAR  
CONCENTRATIONS OF HYDROGEN PEROXIDE IN AERATED 'PURE  
WATER', (U)

AUG 65 23P BALKWELL, WILLIAM R. ;OLDHAM,  
SUSAN B. ;  
REPT. NO. USNRDL-TR-903  
PROJ: SF011 01 03  
TASK: 11275

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*HYDROGEN PEROXIDE, DECOMPOSITION),  
(\*RADIATION CHEMISTRY, HYDROGEN PEROXIDE), WATER,  
IMPURITIES, REACTION KINETICS, DOSE RATE (U)

THE DECOMPOSITION OF HYDROGEN PEROXIDE IN AERATED  
'PURE WATER' WAS STUDIED AS A FUNCTION OF DOSE AND  
INITIAL HYDROGEN PEROXIDE CONCENTRATION,  
(H<sub>2</sub>O<sub>2</sub>)<sub>0</sub>, IN THE 1 TO 100 MILLIMOLAR  
CONCENTRATION REGION. IRRADIATIONS WERE PERFORMED  
WITH A 2000-CURIE CO60 SOURCE AT A DOSE RATE OF  
12.8 KILORADS PER MINUTE. THE DECOMPOSITION OF  
HYDROGEN PEROXIDE WAS FOUND TO FOLLOW FIRSTORDER  
KINETICS WITH RESPECT TO PEROXIDE IN THE 1 TO 100  
MILLIMOLAR CONCENTRATION RANGE. THE SPECIFIC  
PEROXIDE DECOMPOSITION RATE CONSTANT WAS OBSERVED TO  
DECREASE WITH AN INCREASE IN INITIAL PEROXIDE  
CONCENTRATION. THE DECOMPOSITION YIELD OF HYDROGEN  
PEROXIDE, G -(H<sub>2</sub>O<sub>2</sub>), AT A GIVEN DOSE WAS  
FOUND TO INCREASE SIGNIFICANTLY WITH INCREASING  
INITIAL PEROXIDE CONCENTRATION AND TO BE PROPORTIONAL  
TO THE SQUARE ROOT OF THE INITIAL PEROXIDE  
CONCENTRATION UP TO ABOUT 40 MILLIMOLAR PEROXIDE.  
THE PEROXIDE DECOMPOSITION YIELD FOR A GIVEN  
INITIAL PEROXIDE CONCENTRATION WAS OBSERVED TO  
DECREASE CONTINUALLY DURING IRRADIATION. THE RATE  
OF DECREASE WAS FOUND TO BE GREATER FOR HIGHER  
INITIAL CONCENTRATIONS OF PEROXIDE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 623 307

AKRON UNIV OHIO INST OF RUBBER RESEARCH

LOW TEMPERATURE POLYMERIZATION STUDIES.

(11)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 7, 1 JUL-30 SEP  
65,

OCT 65 52P MORTON, MAURICE ;

CONTRACT: AF04 611 9694

PROJ: AFSC 3148

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-618 228.

DESCRIPTORS: (\*RADIATION CHEMISTRY, POLYMERIZATION),  
(\*POLYMERIZATION, LOW TEMPERATURE), (\*HALOCARBON  
PLASTICS, SYNTHESIS(CHEMISTRY)), HALOCARBON PLASTICS,  
FLUORINE COMPOUNDS, ALKENES, REACTION KINETICS, FREE  
RADICALS, GAMMA RAYS, ORGANIC SOLVENTS, VINYL PLASTIC(U)

FURTHER INVESTIGATION OF THE RADIATION  
POLYMERIZATION OF FLUORAL IN METHYLENE CHLORIDE  
CONFIRMED THAT A RATE RELATION OF THE FORM  $RP =$   
 $KP(M)(M)/S$ , (WHERE M = MONOMER, AND S =  
SOLVENT) CAN BE APPLIED OVER A RANGE OF MONOMER  
CONCENTRATION FROM 1 TO 6 MOLAR. THIS CAN BE TAKEN  
AS EVIDENCE FOR TERMINATION BY REACTION WITH THE  
METHYLENE CHLORIDE. THE RESULTS ARE CONSISTENT  
WITH A PREFERRED ANIONIC MODE OF POLYMERIZATION OF  
THIS MONOMER. OTHER EXPERIMENTS HAVE SHOWN THAT  
FLUORAL IS VERY READILY POLYMERIZED BY BASES, EVEN BY  
SUCH WEAKLY BASIC COMPOUNDS AS DIMETHYLFORMAMIDE.  
THE POLYMERIZATION OF THE FLUOROVINYL MONOMERS IS  
PROBABLY CAUSED BY THE HIGH ENERGY RADICAL-CATION  
FORMED AS A RESULT OF PRIMARY RADIOLYSIS, I.E.  
(USING VF AS AN EXAMPLE):  $CH_2 = CH_2 +$   
PHOTON (YIELDS)  $\cdot CH_2CHF(+) + e(-)$ . THIS  
SPECIES CAN POLYMERIZE AS A CATION OR AS A RADICAL;  
HOWEVER, AT LOW TEMPERATURE THE CATION REACTION IS  
THE MORE VIGOROUS:  $\cdot CH_2CHF(+) + VF$  (YIELDS)  
 $\cdot (CH_2CHF)MCH_2CHF(+)$ .

(11)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 624 368 8/1 8/5  
CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY

POSITIVE-ION CHEMISTRY: HIGH YIELDS OF HEAVY  
HYDROCARBONS FROM SOLID METHANE BY IONIZING  
RADIATION, (U)

APR 64 5P DAVIS, DONALD R. ; LIBBY, W. F.

CONTRACT: AF-AFOSR-245-64  
MONITOR: AFOSR , 65-1666

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN SCIENCE, V144 N3621  
P991-2 MAY 22 1964. COPIES TO DDC USERS ONLY.  
SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*METHANE, POLYMERIZATION), (\*HYDROCARBONS,  
SYNTHESIS(CHEMISTRY)), (\*POLYMERIZATION, RADIATION),  
(\*RADIATION CHEMISTRY, HYDROCARBONS), SOLIDIFIED GASES,  
GAMMA RAYS, IONIZATION, ULTRAVIOLET, METEORS,  
GEOCHEMISTRY (U)

AT 77K SOLID METHANE IS POLYMERIZED RAPIDLY AND  
EFFICIENTLY TO HEAVY HYDROCARBONS BY COBALT-60 GAMMA  
RAYS. THE PRODUCT IS A VISCOUS OIL CONSISTING  
MAINLY OF SATURATED AND HIGHLY BRANCHED HYDROCARBONS  
CONTAINING AN AVERAGE OF ABOUT 20 CARBON ATOMS PER  
MOLECULE. THIS WOULD SEEM TO BE EVIDENCE FOR  
POSITIVE-ION CHEMICAL REACTIONS IN THE SOLID STATE  
ANALOGOUS TO THOSE PREVIOUSLY REPORTED TO OCCUR IN  
THE GASEOUS STATE AT PRESSURES ABOVE 0.01 MM-HG.  
IT WOULD THUS APPEAR THAT THE SOLAR IONIZING  
ULTRAVIOLET RADIATION (ABOUT 1 ERG/SQ CM/SEC AT THE  
EARTH) MUST POLYMERIZE METHANE AT AN APPRECIABLE  
RATE UNDER MANY LIKELY CONDITIONS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 626 609 7/5

NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF

C060 GAMMA-RADIOLYSIS OF DEUTERIUM-OXYGEN MIXTURES, (U)

NOV 65 21P KUBOSE, D. A. ;  
REPT. NO. USNRDL-TR-931  
PROJ: SF-111-01-03  
TASK: 11275

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*HEAVY WATER, RADIATION CHEMISTRY),  
(\*RADIATION CHEMISTRY, REACTION KINETICS), COBALT, GAMMA  
RAYS, DEUTERIUM, OXYGEN, CONCENTRATION(CHEMISTRY),  
TRITIUM, REACTOR HAZARDS (U)

THE RATES OF FORMATION OF DEUTERIUM OXIDE IN C060  
GAMMA IRRADIATED GASEOUS MIXTURES OF DEUTERIUM AND  
OXYGEN HAVE BEEN EXAMINED AT INITIAL DEUTERIUM  
CONCENTRATIONS, (D<sub>2</sub>O), RANGING FROM 0.00037 TO  
0.0037 MOLE/L. FIRST- AND ZERO ORDER REACTION RATES  
WITH RESPECT TO DEUTERIUM WERE OBSERVED FOR THE LOW  
AND HIGH (D<sub>2</sub>O), RESPECTIVELY. THE  
CORRESPONDING RATE CONSTANTS FOUND WERE 0.0053/HR AND  
0.0000045 MOLE/L HR AT A DOSE RATE OF 5.61 X 10 TO  
THE 16TH POWER EV/CC HR. THE INITIAL G VALUES  
FOR DEUTERIUM OXIDE FORMATION, G(D<sub>2</sub>O), FOR THE  
LOW AND HIGH (D<sub>2</sub>O) WERE 2.9 AND 7.3,  
RESPECTIVELY. A SEARCH FOR REACTION PRODUCTS OTHER  
THAN DEUTERIUM OXIDE, USING FERROUS SULFATE AND  
TITANIUM SULFATE REAGENTS, ESTABLISHED THAT (A)  
NO DEUTERIUM PEROXIDE WAS FORMED AS A STABLE REACTION  
PRODUCT AND (B) A WALL STABILIZED SPECIES, WHOSE  
IDENTITY WAS NOT ESTABLISHED, WAS OBSERVED; IT  
OXIDIZED THE FERROUS SULFATE REAGENT BUT DID NOT  
REACT WITH THE TITANIUM SULFATE REAGENT. AN 8-FOLD  
CHANGE IN THE SURFACE-TO-VOLUME RATIO OF THE  
IRRADIATION VESSEL DID NOT SIGNIFICANTLY AFFECT THE  
CONCENTRATION OF THIS SPECIES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 628 301 7/5 11/9  
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

INVESTIGATION OF THE ROLE OF FREE RADICALS IN THE  
ACETALDEHYDE POLYMERIZATION PROCESS IN THE SOLID  
PHASE UNDER GAMMA-IRRADIATION, (U)

NOV 65 16P PSHEZETSKII, V. S. ; TUPIKOV, V.  
I. ;  
REPT. NO. FTD-TT-65-978,  
MONITOR: TT , 66-60577

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF  
UNIDENTIFIED MONO. GETEROTSEPNYE VYSOKOMOLEKULYARNYE  
SOIEDINENIYA, SBORNIK STATEI, N. P. 1963 P213-9.

DESCRIPTORS: (\*FREE RADICALS, ALDEHYDES), (\*ALDEHYDES,  
POLYMERIZATION), (\*ACETAL RESINS, PREPARATION),  
(\*RADIATION CHEMISTRY, ALDEHYDES), RECOMBINATION, GAMMA  
RAYS, POLYMERS, DECOMPOSITION, ULTRAVIOLET RADIATION,  
CRYSTALS, PARAMAGNETIC RESONANCE, USSR (U)  
IDENTIFIERS: ACETALDEHYDE (U)

THE EPR METHOD WAS USED TO INVESTIGATE THE  
PROCESSES OF FORMATION AND RECOMBINATIONS OF THE  
RADICALS THAT FORM IN CRYSTALLINE ACETALDEHYDE UNDER  
GAMMA-IRRADIATION. IT WAS ESTABLISHED THAT IN THE  
DOSE RANGE FROM 0.1 TO 10 MRAD, THE RADICAL  
CONCENTRATION CORRESPONDS IN ORDER OF MAGNITUDE TO  
THE CONCENTRATION OF POLYMER CHAINS. RADICAL  
RECOMBINATION TAKES PLACE ABRUPTLY AT TEMPERATURES  
COINCIDING WITH THE 'CRITICAL' TEMPERATURES  
DETERMINED BY THE THERMOGRAPHY METHOD. IT WAS  
FOUND THAT MONOMOLECULAR RAPTURE TAKES PLACE AT SMALL  
RADIATION DOSES; AT LARGER DOSES (0.2 MRAD AND  
UP), CHAIN RUPTURE TAKES PLACE IN ACCORDANCE WITH A  
BIMOLECULAR LAW. UV RADIATION INITIATES  
POLYMERIZATION OF CRYSTALLINE ACETALDEHYDE. THE  
NATURE OF THE RADICALS THAT APPEAR CORRESPONDS  
PERFECTLY TO THAT OF THE RADICALS FORMED ON EXPOSURE  
TO GAMMA-RADIATION; THE CONCENTRATION OF THE RADICALS  
CORRESPONDS TO THAT OF THE MOLECULAR CHAINS. THE  
RESULTS OBTAINED JUSTIFY THE ASSUMPTION THAT  
POLYMERIZATION OF CRYSTALLINE ACETALDEHYDE PROCEEDS  
BY THE RADICAL MECHANISM WHEN INITIATED BY EITHER  
IONIZING RADIATION OR ULTRAVIOLET LIGHT.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 631 997 7/5  
STATE UNIV OF NEW YORK STONY BROOK DEPT OF MATERIALS  
SCIENCE

THE THERMAL DECOMPOSITION OF IRRADIATED  
MATERIALS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
MAR 66 92P JACH, JOSEPH ;  
REPT. NO. TR-2,  
CONTRACT: NONR-4673(00),  
TASK: NR-056-467,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED FOR PUBLICATION IN 'STUDIES  
IN RADIATION EFFECTS' VOL 2.

DESCRIPTORS: (\*RADIATION CHEMISTRY, \*DECOMPOSITION),  
AZIDES, OXALATES, PERMANGANATES, BROMATES, BARIUM, LEAD  
COMPOUNDS, SILVER COMPOUNDS, NICKEL COMPOUNDS, MERCURY  
COMPOUNDS, EXPLOSIVE, STYPHNATES, DAMAGE, RADIATION  
EFFECTS, DYNAMICS, HEAT OF ACTIVATION (U)  
IDENTIFIERS: BROMATES (M)

A STUDY WAS MADE OF THE INFLUENCE OF IRRADIATION ON  
THE THERMAL DECOMPOSITION OF SOLID COMPOUNDS. THE  
ARTICLE IS DIVIDED INTO THREE SECTIONS. THE FIRST  
IS A SUMMARY OF PRESENT DAY KNOWLEDGE OF  
DECOMPOSITIONS OF UNIRRADIATED SOLIDS. THESE ARE  
THE BASIC CONTROL EXPERIMENTS AND THE MAIN PURPOSE OF  
THIS SECTION IS TO FAMILIARIZE THE READER WITH THE  
BASIC LANGUAGE OF THE FIELD. THE SECOND SECTION  
DEALS WITH THE INFLUENCE OF IRRADIATION ITSELF, WHILE  
THE THIRD SECTION EXAMINES VERY BRIEFLY SOME RELATED  
TOPICS. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 632 666 7/5 11/9  
GENERAL DYNAMICS/FORT WORTH TEX NUCLEAR AEROSPACE RESEARCH  
FACILITY

X-IRRADIATION OF NORMAL SATURATED HYDROCARBONS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT., 1 OCT 64-30 SEP 64,

MAY 66 34P ALBRECHT, T. W. ; CHEEVER, P.

R. ;

REPT. NO. FZK-272,  
CONTRACT: AF 29(601)-6643,  
PROJ: AF-6773,  
TASK: 677302,  
MONITOR: AFWL , TR-66-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*HYDROCARBONS, \*RADIATION CHEMISTRY),  
(\*POLYETHYLENE PLASTICS, DAMAGE), ALIPHATIC, ALKENES, X  
RAYS, INFRARED SPECTROSCOPY, FILMS, CHEMICAL BONDS,  
HYDROGEN, LOW-TEMPERATURE, PARAMAGNETIC RESONANCE, FREE  
RADICALS, ETHYLENES, METHANE, IONIZATION,  
(U) IONIZATION (U)

THE DEVELOPMENT OF TRANS-VINYLENE IN X-IRRADIATED  
OCTACOSANE AND MARLEX 6002 POLYETHYLENE FILMS WAS  
MEASURED BY MEANS OF THE INFRARED SPECTROMETER.  
INITIAL DEVELOPMENT OF THE TRANS-VINYLENE IN THE  
OCTACOSANE FILMS AT TEMPERATURES OF 137K, 229K,  
AND 289K HAD A G-VALUE OF 2.1 PLUS OR MINUS 0.4  
BONDS FORMED PER 100 EV, WITH DECAY OF THE TRANS-  
VINYLENE BEING MOST RAPID AT THE HIGHEST TEMPERATURE.  
HYDROGEN EVOLUTION FROM X-IRRADIATED FILMS OF  
THESE SAME MATERIALS WAS MEASURED BY MEANS OF THE  
MASS SPECTROMETER. THE EVOLUTION SHOWED A DECREASE  
AS THE TEMPERATURE OF THE IRRADIATION WAS DECREASED  
BELOW 194.5K, WITH PRACTICALLY NO HYDROGEN  
LIBERATION AT LIQUID-NITROGEN TEMPERATURE. WHEN  
THE COLD IRRADIATED FILMS WERE SLOWLY WARMED, THEY  
RELEASED A BURST OF HYDROGEN AT APPROXIMATELY  
194.5K. THE AMOUNT OF HYDROGEN LIBERATED IN THE  
BURST WAS DEPENDENT UPON THE IRRADIATION TEMPERATURE  
AND THE IRRADIATING TIME. EPR (ELECTRON  
PARAMAGNETIC RESONANCE) SPECTRA OF THE FREE  
RADICALS IN IRRADIATED MARLEX 6002 POLYETHYLENE  
WERE PREDOMINANTLY OF SEVEN LINES CENTERED AT  $G =$   
2.003 AND SPANNING 120 GAUSS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 632 704 7/5  
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND)  
NUCLEAR TECHNOLOGY LAB

RADIATION CHEMISTRY OF ALKYL HALIDES. (U)

DESCRIPTIVE NOTE: DOCTORAL THESIS,  
JAN 65 249P CAPELLOS, C. ;  
CONTRACT: AF 61(052)-456,  
MONITOR: ARL , 65-157

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*HALOGENATED HYDROCARBONS, \*RADIATION),  
IODINE COMPOUNDS, HYDROGEN COMPOUNDS, IODIDES, IODINE,  
PEROXIDES, COMPLEX COMPOUNDS, ABSORPTION SPECTRA,  
OXYGEN, SOLVENTS, REACTION, GREAT BRITAIN (U)

ALKYL IODIDES AND THEIR MIXTURES WERE IRRADIATED WITH CO60 GAMMA RAYS. HYDROGEN IODIDE AND IODINE FORMATION WAS MEASURED AS A FUNCTION OF DOSE FOR DEAERATED LIQUID AND SOLID ALKYL IODIDES AND THEIR MIXTURES. G-VALUES FOR HYDROPEROXIDE FORMATION IN AERATED ALKYL IODIDES WERE MEASURED AND EVIDENCE WAS FOUND FOR DIALKYL PEROXIDE FORMATION IN AERATED ALKYL IODIDES. ABSORPTION SPECTRA OF THE CHARGE TRANSFER COMPLEXES IRI FORMED IN THE PULSE RADIOLYSIS OF ALKYL IODIDES, WERE MEASURED AND MOLAR EXTINCTION COEFFICIENTS AND RATE CONSTANTS FOR THE DECAY OF IRI WERE OBTAINED. THE EFFECT OF OXYGEN AND IODINE ON THE FORMATION AND CONSTANT OF DECAY OF IRI WAS STUDIED. PULSE RADIOLYSIS STUDIES OF ALKYL IODIDES INDICATED THAT THE DECOMPOSITION OF SOLUTE IS LARGER THAN THAT EXPECTED ON THE BASIS OF ENERGY DIRECTLY ABSORBED BY THE SOLUTE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 633 293 7/5  
DEFENCE CHEMICAL BIOLOGICAL AND RADIATION LABS OTTAWA  
(ONTARIO)

THE RADIOLYSIS OF ALKALINE AQUEOUS SOLUTIONS  
CONTAINING HYDROGEN AND OXYGEN. (U)

OCT 65 6P ARMSTRONG, W. A. ;  
REPT. NO. DCBRL-482,

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN CANADIAN JOURNAL OF  
CHEMISTRY, V44 P737-41 1966.  
SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*RADIATION CHEMISTRY, WATER), (\*WATER,  
RADIATION CHEMISTRY), SOLUTIONS(MIXTURES),  
BASES(CHEMISTRY), PH FACTOR, HYDROGEN PEROXIDE, OXYGEN,  
HYDROGEN, COBALT, RADIOACTIVE ISOTOPES, GAMMA RAYS,  
REACTION KINETICS, CANADA (U)

THE INITIAL YIELDS OF H<sub>2</sub>O<sub>2</sub> IN AERATED WATER,  
G(H<sub>2</sub>O<sub>2</sub>)O<sub>2</sub>, AND IN WATER CONTAINING H<sub>2</sub> AND  
O<sub>2</sub>, G(H<sub>2</sub>O<sub>2</sub>)H<sub>2</sub>O<sub>2</sub>, HAVE BEEN MEASURED FOR  
ALKALINE SOLUTIONS IRRADIATED WITH CO-60 GAMMA  
RAYS. G(H<sub>2</sub>O<sub>2</sub>) O<sub>2</sub> DECREASES WITH INCREASING PH  
FROM A VALUE OF 1.22 IN NEUTRAL SOLUTION TO 0.63 IN  
SOLUTIONS OF PH 13.92 AND THE RELATIONSHIP  
 $G(H_2O_2)O_2 = G(H_2O_2) - 1/2F(OH) + 1/$   
 $2G(RED)$  IS VALID OVER THE PH RANGE 7 TO 14.  
G(H<sub>2</sub>O<sub>2</sub>)H<sub>2</sub>O<sub>2</sub> DECREASES FROM 3.30 IN NEUTRAL  
SOLUTION TO A MINIMUM OF 2.00 AT PH 11.35 AND THEN  
INCREASES TO 2.65 AT PH 13.92. THE EQUATION  
 $G(H_2O_2)H_2O_2 = G(H_2O_2) + 1/2G(OH) + 1/$   
 $2G(RED)$ ; WHICH IS APPLICABLE FOR NEUTRAL  
SOLUTIONS, IS NOT VALID FOR BASIC SOLUTIONS. A  
REACTION MECHANISM IN ACCORDANCE WITH THE OBSERVED  
RESULTS AND THE LITERATURE VALUES OF THE RATE  
CONSTANTS OF LIKELY RADICAL REACTIONS HAS BEEN  
DEVELOPED. THE INCREASE IN G(H<sub>2</sub>O<sub>2</sub>)H<sub>2</sub>O<sub>2</sub> AT  
PH > 12 IS ATTRIBUTED TO A DIFFERENCE IN THE RATE  
OF REACTION OF O<sub>3</sub>(-) WITH H<sub>2</sub>O<sub>2</sub> AND  
HO<sub>2</sub>(-),  $K(O_3(-) + H_2O_2 / K(O_3(-) +$   
HO<sub>2</sub>(-) = 2.45. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 633 348 7/5 6/18  
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

CHEMICAL DOSIMETRY OF IONIZING RADIATIONS, (U)

MAR 66 168P KABAKCHI, A. M. ; LAVRENTOVICH,  
YA. I. ; PENKOVSKII, V. V. ;  
REPT. NO. FTD-TT-65-420;  
MONITOR: TT , 66-61339

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF MONO.  
KHMICHESKAYA DOZIMETRIYA IONIZIRUYUSHCHIKH  
IZLUCHENII, IZD-VO AKADEMIYA NAUK UKRAINSKOI SSR,  
KIEV, 1963, P1-76, 86-92, 105-35.

DESCRIPTORS: (\*RADIATION CHEMISTRY, \*RADIATION DOSAGE),  
HEALTH PHYSICS INSTRUMENTATION, TEST METHODS,  
SOLUTIONS (MIXTURES), GELS, SULFATES, IRON COMPOUNDS,  
CERIUM, BENZENE, DYES, NITROGEN COMPOUNDS, OXIDES,  
GLASS, CRYSTALS, ELECTROCHEMISTRY (U)

THIS VOLUME GENERALIZES THE THEORETICAL AND  
EXPERIMENTAL MATERIAL THAT HAS BEEN ACCUMULATED  
DURING RECENT YEARS IN THE FIELD OF CHEMICAL  
DOSIMETRY. ATTENTION IS FOCUSED ON THE  
JUSTIFICATION FOR THE USE OF CHEMICAL-DOSIMETRY  
METHODS TO SOLVE PROBLEMS THAT ARE DIFFICULT OR  
IMPOSSIBLE TO SOLVE BY OTHER METHODS (MEASUREMENT  
OF ABSORBED DOSE IN JOULES PER KILOGRAM, SEPARATE  
DETERMINATION OF THE DOSES OF SEVERAL TYPES OF  
RADIATION ACTING SIMULTANEOUSLY ON THE MEDIUM,  
MEASUREMENT OF LARGE DOSES, AND THE LIKE). THE  
BOOK SETS FORTH IN DETAIL THE TECHNIQUE OF  
DETERMINING SIZE OF DOSE BY CHEMICAL METHODS IN THE  
SOLUTION OF VARIOUS PRACTICAL PROBLEMS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 633 753 6/18 7/5  
MOORE SCHOOL OF ELECTRICAL ENGINEERING UNIV OF  
PENNSYLVANIA PHILADELPHIA

STUDIES ON THE EFFECT OF RADIO-FREQUENCY WAVES IN  
BIOLOGICAL MACROMOLECULES, (U)

AUG 65 4P TAKASHIMA, SHIRO ;  
PROJ: DA-61X99-26-001-03,

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN IEEE TRANSACTIONS ON  
BIO-MEDICAL ENGINEERING VBME-13 N1 P28-31 JAN  
1966.

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*ENZYMES, RADIATION CHEMISTRY),  
(\*DEOXYRIBONUCLEIC ACIDS, RADIATION CHEMISTRY),  
(\*RADIATION CHEMISTRY, RADIOGEOLOGY), PROTEINS, RADIO  
WAVES, HIGH FREQUENCY, MEDIUM FREQUENCY, VERY HIGH  
FREQUENCY (U)

THE EFFECT OF RADIO-FREQUENCY ELECTRIC FIELDS ON  
VARIOUS BIOLOGIC MATERIALS WAS EXAMINED.  
PARTICULARLY, THE EFFECTS ON ALCOHOL DEHYDROGENASE  
AND DNA WERE CAREFULLY INVESTIGATED. TO AVOID  
THE EFFECTS OF HEATING, A PULSED ELECTRIC FIELD WAS  
USED, AND SAMPLES WERE ALSO RIGOROUSLY COOLED. THE  
ACTIVITY OF ALCOHOL DEHYDROGENASE AND THE STRUCTURE  
OF DNA WERE NOT ALTERED, HOWEVER, EVEN BY THE  
PROLONGED IRRADIATION AT HIGH-FIELD INTENSITY BETWEEN  
1 AND ABOUT 60 MC/S. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 634 461 7/5 7/3  
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J INST FOR  
EXPLORATORY RESEARCH

POLYMER FORMATION IN IRRADIATED LIQUID PYRIDINE, (U)

NOV 65 6P PEARCE ,CAROL K. FELLISON,  
JOSEPH E. , JR

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN JOURNAL OF PHYSICAL  
CHEMISTRY V70 N5 P1582-7 1966.

DESCRIPTORS: (\*PYRIDINES, POLYMERIZATION), (\*RADIATION  
CHEMISTRY, PYRIDINES), GAMMA RAYS, X RAYS, DOSE RATE,  
MOLECULAR WEIGHT, HYDROGENATION, MOLECULAR ISOMERISM (U)

PYRIDINE WAS EXPOSED AT ROOM TEMPERATURE TO GAMMA  
OR X-RADIATION WITH TOTAL DOSAGES OF  $3.5-73 \times 10$   
TO THE 19TH POWER EV/G, USING DOSE RATES FROM  $2.47$   
 $\times 10$  TO THE 17TH POWER TO  $1.46 \times 10$  TO THE 21ST  
POWER EV/G HR. THE MOLECULAR WEIGHT OF THE POLYMER  
FORMED INCREASED WITH INCREASING DOSE, EVIDENCE OF  
HYDROGENATION WAS FOUND, AND THE POLYMER YIELD G-  
PYRIDINE = 3.66 WAS DETERMINED. THREE BIPYRIDINE  
ISOMERS WERE DETECTED IN THE POLYMER. THE  
BIPYRIDINE YIELDS WERE DEPENDENT ON TOTAL DOSE AND  
ALSO ON DOSE RATE. THE EXPERIMENTAL RESULTS ARE  
CONSISTENT WITH A MECHANISM INVOLVING C5H4N.  
AND C5H6N. RADICALS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 634 693 7/5

ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD

OBSERVATION OF SHORT-LIVED SPECIES PRODUCED BY X-RAY  
PULSFS, (U)

JUN 66 12P KLEIN, NATHAN ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE ARMY SCIENCE  
CONFERENCE (1966), U. S. MILITARY ACADEMY, WEST  
POINT, N. Y., 14-17 JUNE 1966. COMPLETE PROCEEDINGS  
AVAILABLE IN TWO UNCLASSIFIED VOLUMES AS AD-634 615 AND  
AD-634 616 AND ONE CLASSIFIED VOLUME AVAILABLE TO  
QUALIFIED DDC USERS.

DESCRIPTORS: (\*RADIATION CHEMISTRY, \*X RAYS), (\*WATER,  
RADIATION CHEMISTRY), (\*ELECTRON, RADIATION CHEMISTRY),  
HYDRATES, CHEMICAL REACTIONS, REACTION KINECTICS,  
CARBONATES (U)

A REPORT IS GIVEN ON STUDIES CONCERNING THE  
REACTIONS OF THE HYDRATED ELECTRON DURING AND  
IMMEDIATELY AFTER AN X-RADIATION PULSE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 634 859 7/5 7/3  
AIR FORCE MATERIALS LAB WRIGHT-PATTERSON AFB OHIO

THE CHEMICAL EFFECTS OF IRRADIATED TRIPLE-BOND  
COMPOUNDS. (U)

DESCRIPTIVE NOTE: FINAL REPT. MAR 62-DEC 65,  
APR 66 58P RONDEAU, ROGER E. ;HARRAH,  
LARRY A. ;  
REPT. NO. AFML-TR-66-33,  
PROJ: AF-7367,  
TASK: 736701,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*ACETONITRILE, RADIATION CHEMISTRY),  
(\*PROPIONITRILES, RADIATION CHEMISTRY), (\*ALKYNES,  
\*RADIATION CHEMISTRY), CHEMICAL ANALYSIS, ELECTRON  
PARAMAGNETIC RESONANCE, MASS SPECTROSCOPY, PHASE  
STUDIES, HYDROGEN, DECOMPOSITION, TOXICITY, CHEMICAL  
REACTIONS, POLYMERIZATION, FREE RADICALS, NITRILES (U)  
IDENTIFIERS: \*PROPIONITRILES (M)

THE RADIATION CHEMISTRY OF ACETONITRILE,  
PROPIONITRILE, AND FIFTEEN ALKYNES WAS STUDIED USING  
THREE DIFFERENT EXPERIMENTAL APPROACHES: PRODUCT  
ANALYSIS (PA), ELECTRON SPIN RESONANCE  
SPECTROMETRY (ESR), AND MASS SPECTROMETRY (MS).  
THE RESULTS OF EACH STUDY ARE DISCUSSED IN TERMS OF  
REACTIONS PROCEEDING THROUGH ENERGETIC INTERMEDIATES.  
THE ESR AND MS STUDIES DISCUSS THE  
INTERMEDIATES RESPONSIBLE FOR THE PRODUCT  
DISTRIBUTION FOUND IN THE PA STUDY. TOPICS OF  
DISCUSSION INCLUDE PHASE EFFECTS, EXTENT OF HYDROGEN  
EVOLUTION, TOXIC PRODUCT YIELDS, CYCLIZATION  
REACTIONS, INDUCED POLYMERIZATION, AND RADIATION  
PROTECTION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 635 039 4/1 7/5  
RAND CORP SANTA MONICA CALIF

ELECTRON IONIZATION AND LOSS PROCESSES AND RATES,

(U)

JUN 66 51P CRAIN, C. M. ;  
REPT. NO. P-3389,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED FOR PRESENTATION AT  
CONFERENCE ON GROUND-BASED RADIO-WAVE  
PROPAGATION STUDIES OF THE LOWER IONOSPHERE,  
OTTAWA, CANADA, APRIL 11-15, 1966.

DESCRIPTORS: (\*IONOSPHERE, IONIZATION), (\*PHOTOCHEMICAL  
REACTIONS, IONOSPHERE), (\*RADIATION CHEMISTRY,  
IONOSPHERE), (\*COSMIC RAYS, IONOSPHERIC DISTURBANCES),  
PROTONS, ELECTRONS, NUCLEAR EXPLOSIONS, FISSION  
PRODUCTS, CHEMICAL REACTIONS, ATMOSPHERIC SOUNDING (U)

COSMIC RAYS AND NUCLEAR EXPLOSION FISSION PRODUCTS  
FACTORS WHICH RELATE TO THE IONIZATION STATE IN THE  
REGION BELOW ROUGHLY 100 KM ARE SUMMARIZED. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 639 000 7/5 7/3  
GATES AND CRELLIN LABS OF CHEMISTRY CALIF INST OF TECH  
PASADENA

TRIPLET STATES IN RADIATION CHEMISTRY. RADIOCHEMICAL  
CIS-TRANS ISOMERIZATION. (U)

FFB 66 5P CALDWELL, RICHARD A. ; WHITTEN,  
DAVID G. ; HAMMOND, GEORGE S. ;  
CONTRACT: AF 49(638)-1479,  
MONITOR: AFOSR 66-1807

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN THE JOURNAL OF THE  
AMERICAN CHEMICAL SOCIETY V88 N12 P2659-63 JUN 20  
1966.

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*RADIATION CHEMISTRY, \*MOLECULAR ENERGY  
LEVELS); (\*MOLECULAR ISOMERISM, RADIATION CHEMISTRY),  
ALKENES, EXCITATION, AROMATIC COMPOUNDS, ETHYLENES,  
PROPENES, ORGANIC SOLVENTS, DIENES (U)  
IDENTIFIERS: STILBENES (U)

RADIATION-INDUCED CIS-TRANS ISOMERIZATION OF THREE  
PAIRS OF OLEFINS WAS STUDIED BY DETERMINATION OF BOTH  
INITIAL RATES OF ISOMERIZATION AND THE COMPOSITION OF  
RADIOSTATIONARY STATES. THE DATA CORRELATE  
STRIKINGLY WELL WITH DATA OBTAINED IN SENSITIZED  
PHOTOISOMERIZATION REACTIONS OF THE SAME SUBSTRATES.  
CONSEQUENTLY, IT IS INFERED THAT ISOMERIZATION  
INVOLVES FORMATION AND DECAY OF EXCITED TRIPLET  
STATES OF THE OLEFINS. THE SUM OF THE G VALUES  
FOR THE TRANS TO CIS AND CIS TO TRANS REACTIONS IS  
TAKEN AS THE VALUE OF G FOR FORMATION OF OLEFIN  
TRIPLETS. EXCEPT IN VERY CONCENTRATED SOLUTIONS  
MOST OF THE EXCITATION MUST BE FIRST ABSORBED BY THE  
SOLVENT AND THEN TRANSFERRED TO THE SOLUTE. THE  
HIGHEST YIELD OF TRIPLETS MEASURED IN BENZENE WAS  
9.9, AND A VALUE OF 20 WAS ESTIMATED IN AN EXPERIMENT  
IN WHICH PURE CIS-STILBENE WAS IRRADIATED. THE  
VERY HIGH G VALUES FOR TRIPLETS ARE ATTRIBUTED TO  
THE FACT THAT REACTIVE ENERGY ACCEPTORS CAN COMPETE  
EFFECTIVELY WITH TRIPLET-TRIPLET ANNIHILATION  
REACTIONS IN REGIONS OF HIGH EXCITATION DENSITY  
WITHIN SPURS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 639 389 7/5 11/10  
STANFORD RESEARCH INST MENLO PARK CALIF

A STUDY OF ENERGY TRANSFER PROCESSES IN RADIATION  
CHEMISTRY: TRIPLET-TRIPLET TRANSFER IN  
POLYBUTADIENE. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT., MAR 65-30 JUN 66.

JUL 66 33P GOLUB, MORTON A. ;

CONTRACT: AF 33(615)-2354,

PROJ: AF-7367,

TASK: 736701,

MONITOR: AFML TR-66-2921

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*BUTADIENES, \*RADIATION CHEMISTRY),  
(\*PHOTOCHEMICAL REACTIONS, BUTADIENES), MOLECULAR ENERGY  
LEVELS, EXCITATION, TRANSPORT PROPERTIES, MOLECULAR  
ISOMERISM, POLYMERS, ALKENES, ADDITIVES, BENZENE,  
FILMS (U)

IDENTIFIERS: OCTENES, POLYBUTADIENE POLYMERS (U)

BENZENE PHOTO- AND RADIATION SENSITIZED CIS-TRANS  
ISOMERIZATION OF PENTENE-2, HEXENE-2, HEPTENE-2, AND  
OCTENE-2 ALL YIELD THE SAME PHOTO- AND  
RADIOSTATIONARY CIS/TRANS RATIO, VIZ., 1.0. YIELDS  
OF BENZENE TRIPLET FORMATION AND RADIATION-INDUCED  
UNSENSITIZED ISOMERIZATION OF THE ABOVE OLEFINS ARE  
REPORTED. THIN FILMS OF POLYBUTADIENE CONTAINING  
SMALL AMOUNTS OF CERTAIN TRIPLET-FORMING ORGANIC  
COMPOUNDS WERE ISOMERIZED ON EXPOSURE TO ULTRAVIOLET  
LIGHT. THIS DEMONSTRATES THAT TRIPLET-TRIPLET  
TRANSFER FROM SENSITIZER TO POLYMER DOUBLE BONDS IS  
QUITE EFFICIENT IN THE SOLID STATE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 642 261 7/5 7/3  
NEWCASTLE-UPON-TYNE UNIV (ENGLAND) DEPT OF ORGANIC  
CHEMISTRY

RESEARCH ON ORGANIC RADIATION CHEMISTRY. (U)

DESCRIPTIVE NOTE: ANNUAL SUMMARY REPT.,  
OCT 63 12P ALLAN, L. T. ; SWAN, G. A. ;  
CONTRACT: AF-EOAR-61-35

UNCLASSIFIED REPORT

DESCRIPTORS: (\*AMINES, \*RADIATION CHEMISTRY), ORGANIC  
COMPOUNDS, PIPERIDINES, GAS CHROMATOGRAPHY, GAMMA RAYS,  
DECOMPOSITION, CHEMICAL BONDS, NITROGEN HETEROCYCLIC  
COMPOUNDS, GREAT BRITAIN (U)  
IDENTIFIERS: DIETHYL AMINES (U)

THE RESEARCH ON THE RADIOLYSIS OF AMINES, DESCRIBED  
IN AD-642 264, WAS CONTINUED, WITH SPECIAL EMPHASIS  
ON THE EFFECTS OF GAMMA RADIATION ON DIETHYLAMINE AND  
N-ALLYLPIPERIDINE AND ON GAS CHROMATOGRAPHIC  
SEPARATIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 642 264 7/5 7/3  
KING'S COLL NEWCASTLE-UPON-TYNE (ENGLAND) DEPT OF  
CHEMISTRY

RESEARCH ON ORGANIC RADIATION CHEMISTRY. (U)

DESCRIPTIVE NOTE: ANNUAL SUMMARY REPT.,  
OCT 62 10P ALLAN, L. T. ; SWAN, G. A. ;  
CONTRACT: AF-EOAR-61-35

UNCLASSIFIED REPORT

DESCRIPTORS: (\*AMINES, \*RADIATION CHEMISTRY), ORGANIC  
COMPOUNDS, ALKENES, GAS CHROMATOGRAPHY, PIPERIDINES,  
DECOMPOSITION, MOLECULAR ISOMERISM, GREAT BRITAIN (U)  
IDENTIFIERS: BUTYL AMINES, DIETHYL AMINES,  
PIPECOLINES, TRIETHYL AMINES (U)

A SUMMARY IS GIVEN OF INVESTIGATIONS OF THE GAMMA  
IRRADIATION OF AMINES. THE AMINES STUDIED INCLUDED  
TERTIARY AMINES (TRIETHYLAMINE AND 1-  
METHYLPYPERIDINE), A SECONDARY AMINE  
(DIETHYLAMINE) AND A PRIMARY AMINE (N-  
BUTYLAMINE). SOME WORK WAS ALSO CARRIED OUT ON THE  
IRRADIATION OF AMINE - OLEFIN MIXTURES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 642 579 7/5  
RENSSELAER POLYTECHNIC INST TROY N Y DEPT OF  
CHEMISTRY

SOME STUDIES OF THE IONIZING RADIATION INDUCED  
ISOTOPE EXCHANGE IN GASEOUS NITROGEN. (U)

DESCRIPTIVE NOTE: FINAL REPT., 1 JUL 61-30 JUN 64,  
OCT 66 168P BROWN, R. D. ; DONDES, S. ;  
HARTECK, P. ;

CONTRACT: DA-31-124-ARO(D)-140, DA-ARO(D)-31-124-  
G105

PROJ: DA-2-0-010501-B-700, RPI-321.9

MONITOR: AROD 3058.2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: RESEARCH SUPPORTED IN PART BY  
AEC.

DESCRIPTORS: (\*NITROGEN, \*RADIATION CHEMISTRY), GASES,  
ISOTOPES, EXCITATION, NITROGEN COMPOUNDS, OXIDES,  
DECOMPOSITION, LABELED SUBSTANCES, DOSE RATE, OXYGEN,  
RARE GASES, EXCHANGE REACTIONS (U)

THE GAS PHASE ISOTOPIC EXCHANGE OF  $^{14}\text{N}_2$  WITH  
 $^{15}\text{N}_2$  UNDER IONIZING RADIATION WAS STUDIED IN A  
NUMBER OF SYSTEMS IMPORTANT TO THE IONIZING RADIATION  
INDUCED FIXATION OF NITROGEN. A LIMITED NUMBER OF  
EXPERIMENTS WERE DONE AT TEMPERATURES GREATER THAN  
THE AMBIENT TEMPERATURE OF THE BROOKHAVEN  
NATIONAL LABORATORY GRAPHITE RESEARCH  
REACTOR. SOME EXPERIMENTS WERE ALSO PERFORMED  
USING A 60CO SOURCE AND SOME UTILIZING THE FISSION  
PRODUCTS OF  $^{235}\text{U}$ . (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 646 645 7/5 6/1  
LOUISVILLE UNIV KY

ELECTROMAGNETIC RADIATION CHEMISTRY. (U)

DESCRIPTIVE NOTE: FINAL REPT. 15 MAR 63-31 AUG 66,  
AUG 66 34P CRAWFORD, THOMAS H. ;  
CONTRACT: DA-49-193-MD-2411

UNCLASSIFIED REPORT

DESCRIPTORS: (\*RADIATION CHEMISTRY, ELECTROMAGNETIC RADIATION), (\*TRYPSIN, MAGNETIC FIELDS), (\*COMPLEX COMPOUNDS, RADIATION CHEMISTRY), (\*COPPER COMPOUNDS, MAGNETIC PROPERTIES), (\*MAGNETIC FIELDS, BIOCHEMISTRY), ENZYMES, ELECTRON PARAMAGNETIC RESONANCE, REACTION KINETICS, CHEMICAL BONDS, AMINO ACIDS, PEPTIDES, MOLECULAR ASSOCIATION, PH FACTOR, PROTEINS (U)

AN INVESTIGATION OF THE INTERACTION OF THE ENZYME TRYPSIN WITH MAGNETIC FIELDS WAS UNDERTAKEN. IT APPEARS THAT UNDER THE CONDITIONS STUDIED THERE IS NO DETECTABLE MAGNETIC EFFECT ON THE ACTIVITY OF THIS ENZYME. ESR WAS USED TO DETERMINE STRUCTURAL CHANGES WHICH MIGHT BE INDUCED IN COPPER II-TRYPSIN SOLUTIONS ON EXPOSURE TO MAGNETIC FIELDS OF 14,000 GAUSS. THE BONDING PARAMETER ALPHA SQUARE WAS EVALUATED FOR SEVERAL AMINO ACID, PEPTIDE AND TRYPSIN COMPLEXES WITH COPPER II IONS AT LIQUID NITROGEN TEMPERATURES. THE CHANGES IN THE NATURE OF THE METAL TO LIGAND BONDING IS REFLECTED IN CHANGING VALUES OF ALPHA SQUARE AS THE PH IS VARIED. THERE APPEARS TO BE A REASONABLE CORRELATION BETWEEN THOSE STRUCTURES PROPOSED IN THE LITERATURE AS DETERMINED BY SPECTROPHOTOMETRIC AND POTENTIOMETRIC TECHNIQUES AND THE VALUES OF ALPHA SQUARE AS DETERMINED FROM ESR MEASUREMENTS. OF PARTICULAR INTEREST IS THE MARKED CHANGE IN THE NATURE OF THE BONDING IN THE TRYPSIN--COPPER II COMPLEX OVER THE RANGE PH 5-6, WHICH SUGGESTS A NOTABLE REARRANGEMENT FROM PRIMARILY CARBOXYLATE BONDING SITES TO AMIDE AND AMINE BONDING SITES. THERE DOES NOT APPEAR TO BE ANY DETECTABLE CHANGE IN ESR PARAMETERS ON EXPOSURE OF TRYPSIN-COPPER II SAMPLES TO MAGNETIC FIELDS OF APPROXIMATELY 14,000 GAUSS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 647 576            7/5            7/3            7/4  
NATIONAL BUREAU OF STANDARDS WASHINGTON D C

RADIATION-INDUCED POLYMERIZATION AND OTHER REACTIONS  
OF N-PERFLUOROPENTADIENE-1,4 AT HIGH TEMPERATURE AND  
PRESSURE, (U)

SEP 64    23P            BROWN, D. W. ; FEARN, J. E.  
; LOWRY, R. E. ;  
PROJ: DA-20014501B13B  
MONITOR: AROD    2703:5

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN JOURNAL OF POLYMER  
SCIENCE V3 PTA P1641-60 1965.  
SUPPLEMENTARY NOTE: PRESENTED AT DIVISION OF POLYMER  
CHEMISTRY, NATIONAL AMERICAN CHEMICAL SOCIETY  
MEETING (145TH), NEW YORK, N. Y., SEPTEMBER  
1963.

DESCRIPTORS: (\*RADIATION CHEMISTRY, POLYMERIZATION),  
(\*DIENES, HIGH TEMPERATURE), HIGH PRESSURE, FREE  
RADICALS, POLYMERS, MOLECULAR WEIGHT, ENTROPY, CHEMICAL  
BONDS (U)

THE RADIATION-INDUCED POLYMERIZATION OF N-  
PERFLUOROPENTADIENE-1,4 WAS STUDIED AT TEMPERATURES  
OF 100-170C. AND PRESSURES OF 8,000-15,000 ATM.  
KINETIC EVIDENCE INDICATES THAT POLYMERIZATION  
OCCURS BY A FREE RADICAL REACTION; THE ACTIVATION  
ENERGY IS BETWEEN 14 AND 17 KCAL./MOLE AND THE  
ACTIVATION ENTROPY IS - 8 (PLUS OR MINUS) 5 E.U./  
MOLE. TRANSFER WITH MONOMER LIMITS THE NUMBER-  
AVERAGE DEGREE OF POLYMERIZATION TO VALUES OF 40 OR  
LESS EXCEPT IN SPECIAL CIRCUMSTANCES. DIMERIZATION  
AND DOUBLE BOND MIGRATION OCCUR TO SOME EXTENT; N-  
PERFLUOROPENTADIENE-1,3 IS FORMED IN THE LATTER  
PROCESS. IT AND THE 1,4-DIENE COPOLYMERIZE; THE  
LATTER UNDERGOES CYCLIC ADDITION SO THAT THE POLYMERS  
ARE SOLUBLE AND HAVE LITTLE PERFLUOROVINYL  
UNSATURATION. THE POLYMERS ARE BRITTLE IF THE  
FRACTION OF 1,3-DIENE IN THE POLYMER IS LESS THAN  
0.1. THEY ARE RUBBERY AND OF CONSIDERABLY HIGHER  
MOLECULAR WEIGHT IF THE FRACTION OF 1,3-DIENE IS  
GREATER THAN 0.4. THE THERMAL STABILITY OF THE  
POLYMERS DECREASES AS THE CONTENT OF 1,3-DIENE  
INCREASES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 647 795 7/5  
STATE UNIV OF NEW YORK STONY BROOK

CHEMICAL REACTIVITY AT DEFECT SITES IN SOLIDS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
JAN 67 31P JACH, JOSEPH I  
REPT. NO. TR-3  
CONTRACT: NONR-4673(00)  
PROJ: NR-056 467

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-631 997.

DESCRIPTORS: (\*RADIATION CHEMISTRY, DECOMPOSITION),  
SODIUM COMPOUNDS, BROMINE COMPOUNDS, OXIDES, CRYSTAL  
DEFECTS, REACTION KINETICS, EXCHANGE REACTIONS, SOLIDS,  
CHEMICAL REACTIONS, NUCLEAR RADIATION (U)  
IDENTIFIERS: SODIUM BROMATE (U)

A STUDY WAS MADE OF THE THERMAL DECOMPOSITION OF  
NABRO<sub>3</sub> WHICH THERMALLY DECOMPOSES ACCORDING TO  
THE EQUATION NABRO<sub>3</sub> YIELDS NABR + 3/2  
O<sub>2</sub>. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 649 501 7/5  
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

RADIATION CHEMISTRY, ITS PRINCIPAL TRENDS AND PROBLEMS, (U)

OCT 60 26P BAKH, N. A. IDOLIN, P. I.

REPT. NO. MCL-583/III  
MONITOR: TT 61-19400

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: RADIATIONNAYA KHIMIYA EE OSNOVNYE NAPRAVLENIYA I ZADACHI, TRANS. OF AKADEMIYA NAUK SSSR. VESTNIK, V28 N10 P20-33 1958.

DESCRIPTORS: (\*RADIATION CHEMISTRY, REPORTS), CHARGED PARTICLES, ENERGY, ELECTRONS, IONS, IONIZATION TRAILS, GASES, PARTICLE TRAJECTORIES, EXCITATION, POLYMERS, USSR (U)

RADIATION CHEMISTRY EMBRACES A WIDE RANGE OF DIVERSE PROBLEMS OF THEORETICAL AND APPLIED NATURE. IN THE INITIAL PERIOD OF ITS DEVELOPMENT, ITS APPLIED TREND WAS DOMINATED BY QUESTIONS CONNECTED WITH PROTECTION AGAINST THE HARMFUL ACTION OF RADIATION ON VARIOUS SUBSTANCES AND MATERIALS. TODAY, BESIDES THESE QUESTIONS, THE PROBLEM OF UTILIZING RADIATION TO ACCOMPLISH CHEMICAL PROCESSES YIELDING VALUABLE CHEMICAL PRODUCTS IS BEING MORE AND MORE INSISTENTLY ADVANCED. CONSIDERATION IS GIVEN TO THE STATE OF THE MOST IMPORTANT TRENDS IN MODERN RADIATION CHEMISTRY, AND TO DISCUSS THOSE PROBLEMS OF THE IMMEDIATE FUTURE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 650 085 7/5  
DEFENCE CHEMICAL BIOLOGICAL AND RADIATION LABS OTTAWA  
(ONTARIO)

GAMMA RADIOLYSIS OF CYSTINE IN AQUEOUS SOLUTION.  
DOSE-RATE EFFECTS AND A PROPOSED MECHANISM, (U)

JUN 66 6P PURDIE, JOHN W. ;  
REPT. NO. DCBRL-508

UNCLASSIFIED REPORT  
AVAILABILITY: PUBLISHED IN JOURNAL OF THE  
AMERICAN CHEMICAL SOCIETY V89 P226-30 1967.

DESCRIPTORS: (\*AMINO ACIDS, \*RADIATION CHEMISTRY),  
SOLUTIONS(MIXTURES), ORGANIC SULFUR COMPOUNDS,  
PHOTOLYSIS, DOSE RATE, FREE RADICALS, CHEMICAL  
REACTIONS, CHEMICAL BONDS, MOLECULAR ASSOCIATION, GAMMA  
RAYS, CANADA (U)  
IDENTIFIERS: CYSTINE (U)

SOLUTIONS OF L-CYSTINE (CYSSCY) IN WATER  
(0.0003 M) WERE EXPOSED TO 10,000 RADS OF  
COBALT-60 GAMMA RAYS. G VALUES WERE DETERMINED  
FOR THE FOLLOWING PRODUCTS: CYSO<sub>2</sub>H,  
CYSO<sub>3</sub>H, CYSO<sub>2</sub>SH, CYSSO<sub>3</sub>H, CYSH,  
AND CYSSCY. THE EFFECT OF OH AND SOLVATED  
ELECTRON SCAVENGERS ON THE YIELDS WAS ALSO  
INVESTIGATED. THE YIELDS OF CYSO<sub>2</sub>H,  
CYSO<sub>3</sub>H, AND CYSH WERE DOSE-RATE DEPENDENT  
IN THE RANGE 1 TO 800 RADS/MIN. A MECHANISM FOR  
THE RADIOLYSIS IS PRESENTED AND DISCUSSED; CYSOH  
APPEARS TO BE THE MAIN PRECURSOR OF BOTH CYSO<sub>2</sub>H  
AND CYSO<sub>3</sub>H WITH O<sub>2</sub>(-) PARTICIPATING IN  
FORMATION OF THE LATTER. CYSSCY, THE YIELD OF  
WHICH WAS INDEPENDENT OF DOSE RATE, IS PROBABLY  
PRODUCED FROM CYSTINE BY REACTION WITH CYS  
RADICALS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 653 381 7/5 7/4 7/3  
CALIFORNIA UNIV LOS ANGELES

CHEMISTRY OF POSITIVE IONS. VI. POSITIVE-ION  
CHEMISTRY IN SOLID METHANE, (U)

JUL 66 15P DAVIS, DONALD R. ; LIRBY, W.  
F. ; MEINSCHEN, W. G. ;  
CONTRACT: AF-AFOSR-245-65  
PROJ: AF-9710  
TASK: 971003  
MONITOR: AFOSR 67-1232

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN THE JOURNAL OF  
CHEMICAL PHYSICS, V45 N12 P4481-92 15 DEC 1966.  
SUPPLEMENTARY NOTE: SEE ALSO AD-613 305.

DESCRIPTORS: (\*RADIATION CHEMISTRY, METHANE), (\*METHANE,  
POLYMERIZATION), IONS, PHOTOLYSIS, DOSE RATE, SOLIDIFIED  
GASES, ALKANES, REACTION KINETICS, POLYMERS,  
MICROANALYSIS, NUCLEAR MAGNETIC RESONANCE, INFRARED  
SPECTRA, GAS CHROMATOGRAPHY, HEAT OF COMBUSTION (U)

THE EFFECTS OF GAMMA RAYS (CO60) ON CRYSTALLINE  
METHANE AT 77K ARE THE PRODUCTION OF AN OIL OF MEAN  
COMPOSITION C20H40 AND HYDROGEN. LITTLE ELSE  
IS FORMED. THIS REMARKABLE TRANSFORMATION IS  
THOUGHT TO BE DUE TO THE CHEMICAL PROPERTIES OF THE  
IONS MADE POSSIBLY CH2(+) OR CH3(+). THE  
POLYMER APPARENTLY IS FORMED IN THE SAME SIZE AT ALL  
DOSES SINCE ITS MOLECULAR WEIGHT (BY OSMOTIC  
PRESSURE) WAS FOUND TO BE THE SAME FOR 150 MEGARADS  
AS FOR 4. IT SEEMS LIKELY THAT THIS TYPE OF  
REMARKABLE POLYMERIZATION REACTION IS IN PART THE  
ORIGIN OF THE MILLER-UREY COMPOUNDS AND OF THOSE  
IN METEORITES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 654 502          7/5          18/2          9/2  
ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD

A COMPUTER PROGRAM FOR KINETIC TREATMENT OF RADIATION  
CHEMICAL DATA, (U)

JUN 67          21P          KLEIN, NATHAN ;  
REPT. NO. NDL-TM-36  
PROJ: DA-1N022601A089-03

UNCLASSIFIED REPORT

DESCRIPTORS: (\*RADIATION CHEMISTRY, COMPUTER PROGRAMS),  
(\*RADIOACTIVE ISOTOPES, DIGITAL COMPUTERS), DIFFERENTIAL  
EQUATIONS, DOSE RATE, RADIATION DOSAGE, PROGRAMMING  
LANGUAGES, PH FACTOR, NUMERICAL INTEGRATION (U)

THE COMPUTER PROGRAM DESCRIBED IN THIS REPORT WAS  
DESIGNED TO HELP THE RADIATION CHEMIST KINETICALLY  
EVALUATE HIS DATA. ALTHOUGH THE PROGRAM, PR III,  
WAS SPECIFICALLY DESIGNED FOR DATA EVALUATION IN  
PULSE RADIOLYSIS, IT MAY BE MODIFIED TO PROCESS DATA  
OBTAINED WITH MUCH LOWER DOSE RATES THAN THOSE  
ENCOUNTERED IN PULSE RADIOLYSIS, E.G. RADIOACTIVE  
ISOTOPE RADIATION SOURCES. THE PROGRAM ASSUMES  
THAT ALL REACTIVE SPECIES ARE HOMOGENEOUSLY  
DISTRIBUTED IN SOLUTION AND REQUIRES AS INPUT THE  
INITIAL CONCENTRATION OF ALL SPECIES THAT WILL  
'REACT' DURING THE COURSE OF THE CALCULATION. IN  
ADDITION, THE YIELD OF ALL SPECIES PRODUCED BY THE  
RADIATION IS A REQUIRED INPUT. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 654 510 7/5 11/9 11/1  
PICATINNY ARSENAL DOVER N J FELTMAN RESEARCH LABS

RADIATION GRAFT COPOLYMERIZATION. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
JUN 67 124P HOLAHAN, F. S. ; LEVI, D.

W. ;

PROJ: DA-1C014501B13A  
MONITOR: PA TR-3567

UNCLASSIFIED REPORT

DESCRIPTORS: (\*RADIATION CHEMISTRY, COPOLYMERIZATION),  
(\*COPOLYMERIZATION, REVIEWS), POLYMERS,  
SYNTHESIS(CHEMISTRY), POLYETHYLENE PLASTICS, HALOGENATED  
HYDROCARBONS, POLYAMIDE PLASTICS, ACRYLONITRILE  
POLYMERS, POLYVINYL ALCOHOL, POLYESTER PLASTICS, ACRYLIC  
RESINS, SILICONES, CELLULOSIC RESINS, BIBLIOGRAPHIES (U)  
IDENTIFIERS: GRAFT POLYMERS (U)

THE LITERATURE ON RADIATION GRAFT COPOLYMERIZATION  
IS REVIEWED FOR THE PERIOD BETWEEN THE LATE NINETEEN  
FIFTIES AND THE MIDDLE OF 1966. INCLUDED ARE  
DESCRIPTIONS OF STUDIES RELATED TO THE VARIOUS TYPES  
OF GRAFTING REACTIONS, THE EVALUATION OF FACTORS  
IMPORTANT IN GRAFTING REACTIONS, AND PROPERTIES OF  
THE GRAFTED POLYMERS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 656 760 7/5 11/9  
QUARTERMASTER RESEARCH AND ENGINEERING COMMAND NATICK  
MASS

IRRADIATION 'FACTOR-DEPENDENCY'. STYRENE WITH  
ADDITIVES. (U)

DESCRIPTIVE NOTE: RADIATION CHEMISTRY LAB. SERIES  
RESEARCH REPT.,  
NOV 60 32P DEGERING, ED. F. ; CALDARELLA,  
G. J. ; EVANS, FLORA E. ; GRIB, STEPHEN ; SMITH,  
THROOP ;  
REPT. NO. RR-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PB-145 895.

DESCRIPTORS: (\*STYRENE PLASTICS, \*RADIATION CHEMISTRY),  
STYRENES, POLYMERIZATION, ADDITIVES, SILICONES, FATTY  
ACIDS, FATTY ACID ESTERS, ACRYLIC RESINS, VINYL  
PLASTICS, ACETATES, ACRYLONITRILE POLYMERS, ELECTRON  
IRRADIATION, DOSE RATE, MOISTURE (U)  
IDENTIFIERS: ACRYLIC ACID, METHYLACRYLATE  
POLYMERS (U)

STUDIES INVOLVING THE IRRADIATION OF STYRENE  
(CONTAINING 1% SILICONE OIL, ACRYLIC ACID,  
METHACRYLIC ACID, METHYL ACRYLATE, BUTYL ACRYLATE,  
VINYL ACETATE, OR ACRYLONITRILE) WITH A 2 MEV  
ELECTRON BEAM UNDER VARIOUS EXPOSURE CONDITIONS  
YIELDED THE FOLLOWING CONCLUSIONS: (1) THE  
EFFECT OF AN ADDITIVE IS A FUNCTION OF DOSE RATE WITH  
RESPECT TO BOTH RELATIVE YIELD AND THE MOLECULAR  
WEIGHT OF THE POLYMER, (2) THE MOLECULAR WEIGHT  
DECREASES IN GENERAL WITH AN INCREASE IN DOSE RATE,  
IRRESPECTIVE OF THE ADDITIVE, (3) AN ADDITIVE  
WHICH SIGNIFICANTLY INCREASES THE YIELD TENDS IN  
GENERAL TO PRODUCE SOMEWHAT LOWER MOLECULAR WEIGHT  
POLYMERS THAN DO OTHER ADDITIVES WHICH GIVE LOWER  
YIELDS, (4) AN ADDITIVE, AS A FUNCTION OF DOSE  
RATE, MAY EITHER INCREASE OR DECREASE THE YIELD OF  
POLYMER OBTAINED BY THE IRRADIATION-INDUCED  
POLYMERIZATION OF SOME VINYL MONOMERS, AND (5)  
THE EFFICIENCY OF THE POLYMERIZATION DECREASES  
MARKEDLY FOR THE HIGHER DOSE RATES USED IN THIS  
STUDY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 657 604 7/5 20/12  
UNIVERSITY OF WESTERN ONTARIO LONDON DEPT OF  
CHEMISTRY

IRRADIATION OF KCL CRYSTALS CONTAINING KSH. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
SEP 67 11P FACEY, O. E. ; JACOBS, P.  
W. M. ;  
CONTRACT: N00014-66-C-0142

UNCLASSIFIED REPORT

DESCRIPTORS: (\*POTASSIUM COMPOUNDS, \*RADIATION  
CHEMISTRY), (\*COLOR CENTERS, RADIATION CHEMISTRY),  
CHLORIDES, SULFIDES, HYDRIDES, CRYSTAL LATTICES, X RAYS,  
ULTRAVIOLET RADIATION, PHOTOLYSIS, EXCITATION, BAND  
SPECTRA, DAMAGE, RADIATION EFFECTS (U)  
IDENTIFIERS: POTASSIUM CHLORIDE, POTASSIUM  
HYDROSULFIDE (U)

WHEN CRYSTALS OF KCL CONTAINING KSH ARE  
IRRADIATED WITH X-RAYS AT ROOM TEMPERATURE A  
PROMINENT U-BAND DEVELOPS, THUS CONFIRMING THE  
REACTION  $SH(-)$  TO  $H(-) + S-I$  WHERE  $H(-)$   
) DENOTES A HYDRIDE ION ON A NORMAL LATTICE SITE  
AND  $S-I$  AN INTERSTITIAL S ATOM. PHOTOLYSIS  
WITH U.V. LIGHT AT 10K RESULTS IN THE ABOVE  
REACTION AND ALSO IN THE REACTION  $SH(-)$  TO  $H-I$   
 $+ S(-)$ . THUS EXCITED  $SH(-)*$  IONS CAN  
BREAK UP IN EITHER OF TWO WAYS, NEITHER OF WHICH  
REQUIRES MUCH THERMAL ENERGY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 658 864 7/5 9/2  
JOHNSTON (WILLIAM H) LABS INC BALTIMORE MD

FUNDAMENTAL STUDIES RELATING TO THE RADIATION  
CHEMISTRY OF SMALL ORGANIC MOLECULES. (U)

DESCRIPTIVE NOTE: FINAL REPT. 15 AUG 62-15 DEC 66,  
JAN 67 192P VESTAL, MARVIN ; LERNER, GERALD

CONTRACT: AF 33(657)-10846  
PROJ: AF-7023  
MONITOR: ARL 67-0114

UNCLASSIFIED REPORT

DESCRIPTORS: (\*RADIATION CHEMISTRY, NUMERICAL METHODS  
AND PROCEDURES), (\*COMPUTER PROGRAMS, RADIATION  
CHEMISTRY), ORGANIC COMPOUNDS, POLYATOMIC MOLECULES,  
EXCITATION, HEAT OF ACTIVATION, MASS SPECTRA, MOLECULAR  
ENERGY LEVELS, IONIZATION, PROPANE, FLOW CHARTING (U)

THE REPORT DESCRIBES METHODS FOR PERFORMING  
CALCULATIONS ON THE UNIMOLECULAR REACTIONS OF EXCITED  
POLYATOMIC MOLECULE IONS. THE THEORETICAL BASIS  
FOR THE CALCULATIONS IS PRESENTED. THE COMPLETE  
FORTRAN PROGRAM DEVELOPED FOR PERFORMING THESE  
CALCULATIONS IS GIVEN TOGETHER WITH FLOW CHARTS AND  
DETAILED DESCRIPTIONS FOR THE PROGRAM. THE  
COMPLETE INPUT DATA DECK FOR PROPANE IS GIVEN AND  
SOME EXAMPLES OF THE RESULTS ARE INCLUDED.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 659 776 7/5 18/4  
ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD

GAMMA AND NEUTRON RADIOLYSIS OF THE SYSTEM  
TRICHLOROETHYLENE-OXYGEN-WATER. (U)

DESCRIPTIVE NOTE: REVISED ED.,  
FEB 67 16P SASSE, RONALD A. ;  
REPT. NO. NDL-SP-21

UNCLASSIFIED REPORT  
AVAILABILITY: PUBLISHED IN HEALTH PHYSICS V13  
P1015-24 1967.

DESCRIPTORS: (\*HALOGENATED HYDROCARBONS, \*RADIATION  
CHEMISTRY), (\*DOSIMETERS, RADIATION CHEMISTRY), OXYGEN,  
WATER, SOLUTIONS(MIXTURES), CHLORINE COMPOUNDS,  
ETHYLENES, PHOTOLYSIS, GAMMA RAYS, NEUTRONS,  
ELECTROCHEMISTRY, DOSE RATE (U)  
IDENTIFIERS: ETHYLENE/TRICHLORO (U)

THE GAMMA AND NEUTRON RADIOLYSIS OF AQUEOUS  
TRICHLOROETHYLENE (TCE) WAS INVESTIGATED. THE  
YIELD OF H(+) WAS DETERMINED BY DYNAMIC MEASUREMENT  
OF ELECTRICAL CONDUCTIVITY. YIELDS OF OTHER  
PRODUCTS (CL(-), H2O2, H2, CO2, CO,  
AND HCOCOOH) WERE QUANTITATIVELY DETERMINED BY  
VARIOUS ANALYTICAL TECHNIQUES. G(CL(-)) IS  
GENERALLY EQUAL TO G(H(+)). G(H(+)) INCREASES  
WITH INCREASING OXYGEN CONCENTRATION, INCREASING TCE  
CONCENTRATION, AND DECREASING LINEAR ENERGY  
TRANSFER (LET). THE MAXIMUM VALUE OBSERVED WAS  
126. G(CO2), AND G(HCOCOOH) WERE SMALLER BY  
FACTORS OF 5 TO 10. G(H2) AND G(H2O2) WERE  
INDISTINGUISHABLE FROM THOSE OBSERVED IN PURE WATER.  
THE OXYGEN RICH TCE SYSTEM YIELDS WERE FOUND TO  
BE VERY DOSE-RATE DEPENDENT WHEREAS THE AIR-FREE  
SYSTEM WAS NOT. A MECHANISM IS PROPOSED FOR THE  
AIR-FREE TCE SYSTEM BASED ON LIMITING G VALUES  
OBTAINED BY ADDING SCAVENGERS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 661 875 7/5 7/4  
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

MASS SPECTROMETRIC INVESTIGATION OF H. AND H2  
TRANSFER REACTIONS OF HYDROCARBON IONS, (U)

AUG 66 9P ABRAMSON, FRED P. ; FUTRELL,  
JEAN H. ;  
REPT. NO. APL-67-0110  
PROJ: AF-7023  
TASK: 702310

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN JOURNAL OF PHYSICAL  
CHEMISTRY V71 P1233-7 APR 1967.

DESCRIPTORS: (\*RADIATION CHEMISTRY, HYDROCARBONS),  
(\*HYDROCARBONS, \*MASS SPECTROSCOPY), ALKANES,  
CYCLOALKANES, ALKENES, FREE RADICALS, HYDROGEN,  
PHOTOLYSIS, PROBABILITY, TRACER STUDIES (U)

REACTIONS BETWEEN ALKANE AND CYCLOALKANE MOLECULAR  
IONS AND UNSATURATED MOLECULES WERE INVESTIGATED BOTH  
IN A TANDEM MASS SPECTROMETER AND IN A CONVENTIONAL  
INSTRUMENT. THE REACTIONS INVOLVING THE TRANSFER  
OF H. OR H2 FROM THE ION TO THE UNSATURATE ARE  
REPRESENTED BY  $RH_2(+) + ACCEPTOR \rightarrow R(+) +$   
PRODUCT MOLECULE OR  $RH(+) + PRODUCT RADICAL$ . IN  
ADDITION, THE RELATIVE CROSS SECTIONS FOR THE  
REACTIONS OF CYCLOHEXANE IONS WITH A NUMBER OF  
ACCEPTOR MOLECULES ARE REPORTED. THE EFFECTS OF  
TRANSLATIONAL ENERGY WERE INVESTIGATED FOR ION  
ENERGIES BETWEEN 0.4 AND 2.6 EV IN ORDER TO GAIN  
INFORMATION ABOUT THE MECHANISM OF THE REACTION.  
STUDIES OF NEUTRAL TRANSFER FROM PARTIALLY LABELED  
MOLECULE IONS PROVIDE SOME INDICATION OF THE  
POSITIONAL PROBABILITIES OF THE REACTION.  
IMPLICATIONS OF THESE REACTIONS TO RADIATION  
CHEMISTRY ARE DISCUSSED BRIEFLY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 661 887 7/5 7/4 20/9  
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

ELEMENTARY PROCESSES OF HIGH-ENERGY CHEMISTRY  
(COLLECTION OF ARTICLES). (U)

MAY 67 449P  
REPT. NO. FTD-MT-66-04

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED MACHINE TRANS. OF MONO.  
ELEMENARNYE PROTSESSY KHMII VYSOKIKH ENERGII,  
MOSCOW, 1965 P1-318. ALSO PUB. AS SIMPOSIUM PO  
ELEMENTARNYM PROTSESSAM KHMII VYSOKIKH ENERGII,  
MOSCOW, 18-22 MAR 63. TRUDY.

DESCRIPTORS: (\*PHOTOCHEMICAL REACTIONS, SYMPOSIA),  
(\*RADIATION CHEMISTRY, SYMPOSIA), (\*THERMOCHEMISTRY,  
SYMPOSIA), ELECTRONS, IONS, FREE RADICALS, ATOMIC ENERGY  
LEVELS, EXCITATION, INTERACTIONS, IONOSPHERE, PLASMA  
MEDIUM, LUMINESCENCE, DAMAGE, RADIATION EFFECTS,  
REACTION KINETICS, ENERGY CONVERSION, LASERS, USSR (U)

THE DOCUMENT IS COMPRISED OF TRANSLATIONS OF  
CONDENSED VERSIONS OF OVER 60 PAPERS PRESENTED AT A  
SYMPOSIUM SPONSORED BY THE AN SSR INSTITUT  
KHMICHESKOY FIZIKI IN MARCH 1963. PAPERS  
CONCERNING THE FOLLOWING AREAS OF RESEARCH ARE  
INCLUDED: ELEMENTARY PROCESSES IN GASES WITH THE  
PARTICIPATION OF ELECTRONS AND IONS; GAS PHASE  
REACTIONS OF HOT ATOMS; GENERAL QUESTIONS IN THE  
THEORY OF ELEMENTARY GAS REACTIONS; REACTIONS IN  
THE IONOSPHERE; COMPLEX PROCESSES AT HIGH  
TEMPERATURES AND IN PLASMAS; ELECTRON ENERGY  
TRANSFER; ELECTRONS AND IONS IN SOLID ORGANIC  
MEDIA; FORMATION AND RECOMBINATION OF FREE RADICALS  
IN SOLIDS; MECHANISMS OF PHOTOCHEMICAL AND  
RADIATION-CHEMICAL REACTIONS; CHEMICAL REACTIONS AS  
POSSIBLE SOURCES OF INDUCED RADIATION. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 662 061            7/5            9/2            4/1  
BALLISTIC RESEARCH LABS ABERDEEN PROVING GROUND MD  
SOLUTIONS OF REACTION RATE EQUATIONS PERTAINING TO  
ELECTRON IRRADIATION OF 4:1 MIXTURES OF N2 AND O2, (U)  
SEP 67 122P            NILES, FRANKLIN E. ; LORTIE,  
EDNA L. ;  
REPT. NO. BRL-1372

UNCLASSIFIED REPORT

DESCRIPTORS: (\*NITROGEN, \*ELECTRON IRRADIATION),  
(\*OXYGEN, ELECTRON IRRADIATION), (\*RADIATION CHEMISTRY,  
REACTION KINETICS), (\*REACTION KINETICS, \*COMPUTER  
PROGRAMS), IONS, GAS IONIZATION, NITROGEN OXIDES, GAS  
DISCHARGES, ELECTRON BEAMS (U)

ONE OF THE KENESHEA COMPUTER CODES (SEE AD-  
424 173) WAS ADAPTED FOR USE ON THE BALLISTIC  
RESEARCH LABORATORIES ELECTRONIC SCIENTIFIC  
COMPUTER. USING THIS MODIFIED CODE, REACTION  
RATE EQUATIONS WERE SOLVED FOR THE FOLLOWING 15  
SPECIES: E, NO2(-), O(-), O2(-),  
O3(-), N2(+), NO(+), O(+), O2(+),  
N, NO, N2O, NO2, O, AND O3. THE  
CALCULATIONS WERE MADE FOR A 4:1 MIXTURE OF N2  
AND O2 AT 1 TORR TOTAL PRESSURE AND 300K. RATE  
CONSTANTS AS GIVEN BY KENESHEA AND FOWLER (SEE  
AD-646 975) WERE USED. THE SOLUTIONS ARE  
PRESENTED AS NUMBER DENSITIES VERSUS TIME AFTER THE  
START OF THE IRRADIATING ELECTRON BEAM. A  
DESCRIPTION OF THE MODIFIED CODE IS PRESENTED.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 662 736 7/5  
ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD

PULSE RADIOLYSIS OF AQUEOUS SOLUTIONS, (U)

NOV 67 50P KLEIN, NATHAN ; FANNING, JAMES  
E. , JR. ; WARNER, JOHN W. ;  
REPT. NO. NDL-TR-96  
PROJ: DA-1N022601A089  
TASK: 1N022601A08903

UNCLASSIFIED REPORT

DESCRIPTORS: (\*RADIATION CHEMISTRY,  
SOLUTIONS(MIXTURES)), ELECTRONS, WATER, MOLECULAR  
ASSOCIATION, X RAYS, PHOTOLYSIS, SODIUM COMPOUNDS,  
CARBONATES, BARIUM COMPOUNDS, HYDROXIDES, SULFURIC ACID,  
PERCHLORIC ACID, ABSORPTION SPECTRA (U)  
IDENTIFIERS: ELECTRONS, SOLVATES (U)

X-RAY INDUCED AQUEOUS CHEMICAL SPECIES WERE  
EXAMINED FOR REACTION CHARACTERISTICS AND HOMOGENEOUS  
DISPERSION. A 3 KRAD, 50 NS, X-RAY PULSE FROM AN  
ELECTRON ACCELERATOR PRODUCED THE HYDRATED ELECTRON,  
E(-)AQ, IN SOLUTIONS OF NA2CO3, BA(OH)2,  
H2SO4, AND HClO4. KINETIC SPECTROSCOPY  
WITH NANOSECOND RANGE RESOLVING TIME MEASURED THE  
OPTICAL ABSORPTION OF E(-)AQ BUT SHOWED NO  
EVIDENCE OF ANY NONHOMOGENEOUS DISPERSION OF E(-  
)AQ. THIS INDICATES THAT ANY SPUR LIFETIME OF  
E(-)AQ IS LESS THAN 1 NS. THE HYDRATED  
ELECTRON HAS A RAPID, APPARENT SECOND-ORDER DECAY IN  
AIR-FREE ALKALINE SOLUTIONS DURING THE FIRST HALF  
MICROSECOND AFTER THE X-RAY PULSE. IT IS  
PROPOSED THIS DECAY MAY BE DUE TO THE REACTION OF  
E(-)AQ WITH EITHER H2O(+) OR EXCITED WATER,  
H2O\*. THE DATA ARE SUCH THAT NEITHER POSSIBLE  
SPECIES CAN BE DISMISSED AS LESS PLAUSIBLE THAN THE  
OTHER. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 664 883 7/5 11/9  
AEROSPACE CORP EL SEGUNDO CALIF LAB OPERATIONS

PULSE RADIOLYSIS OF POLYSTYRENE, (U)

OCT 67 31P HO, S. K. ; SIEGEL, SEYMOUR ;  
SCHWARZ, HAROLD A. ;  
REPT. NO. TR-0158(3250-20)-1  
CONTRACT: F04695-67-C-0158  
MONITOR: SAMSO TR-68-30

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH  
BROOKHAVEN NATIONAL LAB., UPTON, N. Y.

DESCRIPTORS: (\*STYRENE PLASTICS, \*RADIATION CHEMISTRY),  
ELECTRON IRRADIATION, DECOMPOSITION,  
SOLUTIONS(MIXTURES), AMINES, POLYCYCLIC COMPOUNDS,  
MOLECULAR ENERGY LEVELS, RELAXATION TIME, FREE RADICALS,  
TRANSPORT PROPERTIES, ABSORPTION SPECTRA (U)

THE OPTICAL ABSORPTION SPECTRA OF THE TRANSIENT  
SPECIES PRODUCED BY PULSE ELECTRON RADIOLYSIS OF  
POLYSTYRENE ARE REPORTED. POLYSTYRENE SAMPLES  
CONTAINING VARIOUS AROMATIC SOLUTES, AS WELL AS  
SOLUTE-FREE POLYSTYRENE SAMPLES, WERE EXAMINED. IN  
SOLUTE-FREE POLYSTYRENE, THE NEGATIVE ION OF  
POLYSTYRENE IS OBSERVED. HOWEVER, IN SAMPLES  
CONTAINING TRIPHENYLAMINE AS A SOLUTE, THE SOLUTE  
POSITIVE ION IS OBSERVED. THE DECAY CONSTANTS OF  
THE ION POPULATIONS ARE OF THE ORDER OF MILLISECONDS.  
IN POLYSTYRENE SAMPLES CONTAINING AROMATIC SOLUTES,  
THE ONLY NEW SPECIES OBSERVED ARE THE CORRESPONDING  
SOLUTE TRIPLET STATE MOLECULES. ANALYSIS OF THE  
DATA INDICATES THAT THE ENERGY TRANSFER FROM HOST  
POLYMER TO SOLUTE OCCURS BY A RANDOM WALK MIGRATION  
OF SINGLET STATE EXCITATION ENERGY IN THE POLYMER.  
SOLUTE TRIPLET STATE MOLECULES ARE FORMED BY  
INTRAMOLECULAR INTERSYSTEM CROSSING IN THE SOLUTE  
MOLECULE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 669 145 7/5  
IIT RESEARCH INST CHICAGO ILL

NATURE OF THE INTERACTION OF SECONDARY ELECTRONS WITH  
CHEMICAL SYSTEMS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 SEP 61-31 MAR 67,  
APR 68 43P FENG, PAUL ;  
REPT. NO. IITRI-U-6027-4  
CONTRACT: AF 49(638)-1104  
PROJ: AF-9760  
TASK: 976002  
MONITOR: AFOSR 68-0941

UNCLASSIFIED REPORT

DESCRIPTORS: (\*ELECTRON IRRADIATION, ORGANIC COMPOUNDS),  
(\*RADIATION CHEMISTRY, ELECTRONS), SPACE ENVIRONMENTS,  
SECONDARY EMISSION, DAMAGE, RADIATION EFFECTS, ALKANES,  
MASS SPECTROSCOPY, GAS CHROMATOGRAPHY, PROTON  
BOMBARDMENT, RECOIL ATOMS, IONIZATION, PROBABILITY (U)  
IDENTIFIERS: HEXANES (6 C) (U)

THE PRIMARY EFFORT WAS DIRECTED TOWARD DEVELOPMENT OF THE PROCEDURES AND ACTUAL EXPERIMENTS FOR STUDIES INVOLVING THE INTERACTION OF LOW ENERGY ELECTRONS WITH SIMPLE ORGANIC COMPOUNDS, PRINCIPALLY N-HEXANE. BOTH PHOTOELECTRIC AND THERMIONIC SOURCES WERE USED, THE ELECTRONS WERE ACCELERATED BY MEANS OF ELECTROSTATIC FIELDS BUILT IN THE IRRADIATION VESSEL, AND ANALYSIS OF THE PRODUCTS OBTAINED WAS CARRIED OUT USING MASS SPECTROMETRY AND GAS CHROMATOGRAPHY. OTHER EXPERIMENTS WHICH HAVE BEEN PERFORMED INCLUDED IRRADIATION BY LOW ENERGY PROTONS OBTAINED BY SLOWING DOWN HIGHER ENERGY PROTONS FROM A VAN DE GRAAFF GENERATOR, AS WELL AS PRELIMINARY EXPERIMENTS USING THE RECOIL NUCLEI FORMED BY NEUTRON CAPTURE PROCESSES. RESULTS SHOW THAT ALTHOUGH LOW ENERGY ELECTRONS IN THE SUB-KEV RANGE AND PROTONS IN THE NEAR MEV RANGE HAVE COMPARABLE VELOCITIES AND COMPARABLE LET VALUES, THE NATURE OF THE CHEMICAL PROCESSES INDUCED BY THE INTERACTION OF THESE TWO KINDS OF RADIATION MAY NEVERTHELESS DIFFER FROM EACH OTHER. SEVERAL POSSIBLE ALTERNATIVE EXPLANATIONS FOR THIS PHENOMENON HAVE BEEN EXAMINED AND THE MOST PLAUSIBLE ONE APPEARS TO BE A CONCEPT BASED ON IONIC REACTION MECHANISMS FOR SOME OF THE PRODUCTS AND THE RELATIVE TOTAL IONIZATION CROSS SECTIONS OF THESE RADIATIONS AT SUCH ENERGY RANGES. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 669 794 7/5 7/4  
ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD

REACTIONS OF THE HYDRATED ELECTRON IN ALKALINE SOLUTION.

(U)

MAY 68 12P KLEIN, NATHAN ; TRUMBORE,  
CONRAD N. ; FANNING, JAMES E. , JR. ; WARNER,  
JOHN W. ;

REPT. NO. NDL-SP-25

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN JOURNAL OF PHYSICAL CHEMISTRY, V72 N3 P880-4 1968.

DESCRIPTORS: (\*COMPLEX COMPOUNDS, \*ELECTRONS),  
(\*RADIATION CHEMISTRY, SOLUTIONS(MIXTURES)), HYDRATES,  
ABSORPTION SPECTRA, BASES(CHEMISTRY), SODIUM COMPOUNDS,  
CARBONATES, BARIUM COMPOUNDS, HYDROXIDES, SULFURIC ACID,  
PERCHLORIC ACID, WATER, MOLECULAR ASSOCIATION (U)  
IDENTIFIERS: BARIUM HYDROXIDE, SODIUM CARBONATE,  
\*ELECTRONS, \*SOLVATES (U)

AN INVESTIGATION OF CHEMICAL REACTIONS TAKING PLACE IN AQUEOUS SOLUTIONS DURING AND IMMEDIATELY AFTER AN X-RADIATION PULSE WAS CARRIED OUT. EQUIPMENT WITH RESOLVING TIME IN THE NANOSECOND RANGE WAS ASSEMBLED TO MEASURE OPTICAL ABSORPTION AS A FUNCTION OF TIME USING 6328-A LIGHT. THE HYDRATED ELECTRON,  $EAQ(-)$ , WAS PRODUCED IN SOLUTIONS OF  $Na_2CO_3$ ,  $BA(OH)_2$ ,  $H_2SO_4$ , AND  $HClO_4$  BY A 3-KRAD, 50-NSEC X-RAY PULSE FROM AN ELECTRON ACCELERATOR. NO EVIDENCE FOR NONHOMOGENEOUS DISTRIBUTION OF  $EAQ(-)$  WAS OBTAINED IN THE TIME FRAME INVESTIGATED. IN AIR-FREE ALKALINE SOLUTION, AN EXTREMELY RAPID DECAY OF THE  $EAQ(-)$  ADSORPTION WAS OBSERVED. THIS DECAY IS OBSERVED FOR APPROXIMATELY 0.5 MICROSEC AFTER AN X-RAY PULSE. THE VERY FAST DISAPPEARANCE IS QUENCHED WHEN THE SOLUTIONS CONTAIN AN EXCESS OF STRUCTURE-BREAKING IONS OVER STRUCTURE MAKERS. IT IS POSTULATED THAT THE OBSERVED DECAY IS DUE TO REACTION OF  $EAQ(-)$  WITH  $H_2O^*$ . (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 674 072 7/5 11/9  
NATIONAL BUREAU OF STANDARDS WASHINGTON D C

RADIATION-INDUCED COPOLYMERIZATION OF  
TETRAFLUOROETHYLENE AND 3,3,3-TRIFLUOROPROPENE UNDER  
PRESSURE, (U)

SEP 67 15P BROWN, DANIEL W. ; WALL, LEO  
A. ;  
PROJ: DA-20014501B13B  
MONITOR: AROD 2703:6

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF POLYMER SCIENCE,  
PT. A-1, V6 P1367-1379 1968.  
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 31 JUL  
67.

DESCRIPTORS: (\*RADIATION CHEMISTRY, \*COPOLYMERIZATION),  
(\*HALOGENATED HYDROCARBONS, COPOLYMERIZATION),  
FLUORINE COMPOUNDS, ETHYLENES, PROPENES, GAMMA RAYS,  
REACTION KINETICS, MOLECULAR WEIGHT, HALOCARBON  
PLASTICS, SYNTHESIS(CHEMISTRY), PHYSICAL PROPERTIES (U)  
IDENTIFIERS: ETHYLENE/TETRAFLURO, PROPENE/3-3-3-  
TRIFLUORO (U)

A STUDY WAS MADE OF THE GAMMA-RAY-INDUCED  
COPOLYMERIZATION OF TETRAFLUROETHYLENE AND 3,3,3-  
TRIFLUOROPROPENE. COPOLYMERIZATIONS WERE CARRIED  
OUT AT 100C AND 5000 ATM. PRESSURE AND AT 21C AND  
VARIOUS PRESSURES UP TO 8000 ATM. THE REACTIVITY  
RATIOS CALCULATED FROM THE COMPOSITION DATA INDICATE  
THAT THE PROPAGATION RATE CONSTANTS FAVOR ADDITION OF  
TRIFLUOROPROPYLENE BY A FACTOR OF 3-7; INDIVIDUAL  
VALUES DEPENDED LITTLE ON THE POLYMERIZATION PRESSURE  
AND TEMPERATURE. POLYMERIZATION RATES CHANGED  
LITTLE WITH MONOMER COMPOSITION BETWEEN 0 AND 75%  
TETRAFLUROETHYLENE; BETWEEN 75 AND 95%  
TETRAFLUROETHYLENE THEY INCREASED BY A FACTOR OF 10.  
AS MANY AS 850,000 MOLECULES WERE POLYMERIZED PER  
100 E.V. ABSORBED. THE COPOLYMERS ARE SOLUBLE IN  
HEXAFLUROBENZENE AT 29.6C IF THEY CONTAIN LESS  
THAN 70% TETRAFLUROETHYLENE. INTRINSIC  
VISCOSITIES RANGE FROM 0.1 TO ABOUT 10 DL./G. FROM  
VARIOUS CONSIDERATIONS IT APPEARS LIKELY THAT THE  
DEGREE OF POLYMERIZATION IS ABOUT EQUAL TO THE  
KINETIC CHAIN LENGTH IN HIGH-PRESSURE POLYMERIZATIONS  
AT 21C; AT AUTOGENOUS PRESSURE OR AT 5000 ATM AND  
100C, MONOMER TRANSFER REDUCES THE VALUE  
CONSIDERABLY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 675 757 7/5  
FRANKFORD ARSENAL PHILADELPHIA PA

PHOTOLYSIS AND RADIOLYSIS OF PROPARGYL BROMIDE, (U)

DEC 63 9P TRACHTMAN, M. I  
REPT. NO. FA-A64-34  
PROJ: DA-1-T-061102-B-13-A

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF PHYSICAL  
CHEMISTRY, V68 N6 P1415-1419 JUN 64.

DESCRIPTORS: (\*ALKYNES, \*RADIATION CHEMISTRY),  
HALOGENATED HYDROCARBONS, BROMINE COMPOUNDS, PHOTOLYSIS,  
FREE RADICALS, CHEMICAL BONDS (U)  
IDENTIFIERS: RADIOLYSIS (U)

THE RADIATION AND PHOTOCHEMISTRY OF PROPARGYL BROMIDE IN THE LIQUID PHASE WAS STUDIED IN THE PRESENCE AND ABSENCE OF FREE-RADICAL SCAVENGERS AT 25C. THE GASEOUS PRODUCTS FROM RADIOLYSIS WERE HYDROGEN, ACETYLENE, AND METHYLACETYLENE, WHEREAS ONLY METHYLACETYLENE WAS OBSERVED IN PHOTOLYSIS. THE FAILURE OF OXYGEN AND DIPHENYLPICRYLHYDRAZYL TO INHIBIT ACETYLENE FORMATION WAS ATTRIBUTED TO ITS FORMATION VIA AN ION-MOLECULE REACTION SUGGESTED BY A STUDY OF THE PRESSURE DEPENDENCE OF THE MASS SPECTRUM OF PROPARGYL BROMIDE. THE DATA DO NOT PERMIT ANY CONCLUSIONS REGARDING THE EXTENT OF FORMATION OF ACETYLENE VIA HOT RADICAL AND EXCITED MOLECULE REACTIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 675 920 20/13 7/5  
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

ACADEMY OF SCIENCES OF THE BELORUSSIAN SSR. NEWS.  
SERIES IN THE PHYSICAL AND TECHNICAL SCIENCES, NO. 4,  
1966 (SELECTED ARTICLES), (U)

AUG 67 63P KRASIN, B. A. ; LITVENENKO,  
A. K. ; GALITSEISKII, E. M. ; DANILOU, YU I. ;  
KALININ, E. K. ;  
REPT. NO. FTD-HT-23-892-67

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF  
AKADEMIYA NAVUK BSSR, MINSK. VESTSI. SERYYA  
FIZIKA-TEKHNICHNYKH NAVUK, N4 P5-11, 32-55, 138 1966,  
BY E. HARTER.

DESCRIPTORS: (\*NUCLEAR REACTORS, USSR), (\*RADIATION  
CHEMISTRY, REPORTS), HEAT TRANSFER, TRANSIENTS, BORON,  
NUCLEAR REACTORS, INTENSITY, NUCLEAR RADIATION,  
MATHEMATICAL ANALYSIS, GAS FLOW, NEUTRON FLUX,  
HYDRODYNAMICS, THERMODYNAMICS (U)  
IDENTIFIERS: TRANSLATIONS (U)

CONTENTS: CALCULATION OF THE RADIATION  
INTENSITY OF THE BORON-CONTAINING RADIATION ELEMENT  
OF THE IRT-2000 LOOP UNIT; CONVECTIVE HEAT  
EXCHANGE IN A TUBE WITH PULSATIONS OF THE GASEOUS  
HEAT CARRIER WITH A FREQUENCY CORRESPONDING TO THE  
SECOND RESONANCE HARMONIC; UNSTEADY CONVECTIVE HEAT  
EXCHANGE AND HYDRODYNAMICS IN CHANNELS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 676 655 7/5 8/4 20/12  
KANSAS UNIV LAWRENCE DEPT OF GEOLOGY

RADIATION DAMAGE AND CHEMICAL REACTIONS INDUCED IN  
CRYSTALLINE SOLIDS BY HIGH-ENERGY PROTON  
BOMBARDMENT. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 FEB 67-1 APR 68,  
SEP 68 25P ZELLER, EDWARD J. ;  
DRESCHHOFF, GISELA ;  
CONTRACT: F19628-67-C-0182  
PROJ: AF-8602  
TASK: 860202  
MONITOR: AFCL 68-0350

UNCLASSIFIED REPORT

DESCRIPTORS: (\*CRYSTALS, \*DAMAGE), (\*RADIATION  
CHEMISTRY, CRYSTALS), DIAMONDS, GRAPHITE, SILICON  
CARBIDES, GLASS, PROTON BOMBARDMENT, DEUTERON  
BOMBARDMENT, ALPHA BOMBARDMENT, ORGANIC COMPOUNDS,  
SYNTHESIS(CHEMISTRY), COSMIC RAYS, SOLAR RADIATION,  
(U)SOLAR RADIATION (U)  
IDENTIFIERS: TEKTITES (U)

THE OBJECTIVES OF THE RESEARCH SUMMARIZED IN THE  
REPORT WERE TWOFOLD. FIRST, AN EFFORT WAS MADE TO  
DETERMINE WHETHER HEAVY PARTICLE IRRADIATION COULD  
PRODUCE SIGNIFICANT CHANGES IN THE INFRARED  
ABSORPTION CHARACTERISTICS OF VARIOUS SUBSTANCES.  
SECOND, AFTER HAVING OBSERVED THAT SUBSTANTIAL  
CHANGES WERE PRODUCED, AN ATTEMPT WAS MADE TO  
DETERMINE THE NATURE OF THE DEFECTS OR REACTION  
PRODUCTS. IRRADIATIONS WERE PERFORMED UNDER A  
VARIETY OF CONDITIONS AND PROTONS, DEUTERONS AND  
ALPHA PARTICLES WERE USED. ENERGIES RANGED FROM  
0.7 MEV TO 1.8 MEV. TARGET MATERIALS WERE  
DIAMOND, GRAPHITE, SILICON CARBIDE, AND TEKTITE  
GLASS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 676 919 7/5  
FRANKFORD ARSENAL PHILADELPHIA PA

EFFECT OF DENSITY ON THE RADIOLYSIS OF  
PROPYLENE. (U)

DESCRIPTIVE NOTE: TECHNICAL RESEARCH ARTICLE,  
66 10P TRACHTMAN, M. ;  
REPT. NO. FA-A66-20  
PROJ: DA-1-T-061102-B-13-A

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN JNL. OF PHYSICAL  
CHEMISTRY, V70 P3382-3388 1966.

DESCRIPTORS: (\*PROPENES; \*RADIATION CHEMISTRY), DENSITY,  
THERMODYNAMICS, OXYGEN, HYDROGEN, METHANE, CATALYSIS,  
MOLECULAR WEIGHT, MIXTURES, LIQUEFIED GASES (U)

THE RADIOLYSIS OF PROPYLENE WAS STUDIED AT VARIOUS  
TEMPERATURES BOTH BELOW AND ABOVE THE CRITICAL  
TEMPERATURE AS A FUNCTION OF DENSITY. THE YIELDS  
OF BOTH H<sub>2</sub> AND CH<sub>4</sub> DECREASED WITH INCREASING  
DENSITY AT ALL TEMPERATURES. THE MOST STRIKING  
FEATURE OF THE DATA IS THE APPARENT CONSTANCY OF THE  
YIELD OF H<sub>2</sub> AND CH<sub>4</sub> IN THE TWO-PHASE REGION.  
THERE ALSO APPEARS TO BE A DENSITY-INDEPENDENT  
REGION ABOVE THE CRITICAL TEMPERATURE. PROPYLENE  
WAS IRRADIATED IN THE PRESENCE OF O<sub>2</sub> AND THE  
RESULTS SHOW THAT IN THE GAS PHASE THE YIELDS OF H<sub>2</sub>  
AND CH<sub>4</sub> WERE SHARPLY DECREASED. IN THE TWO-PHASE  
REGION THE INHIBITORY EFFECT OF O<sub>2</sub> IS MARKEDLY  
DECREASED FOR BOTH H<sub>2</sub> AND CH<sub>4</sub>. MIXTURES OF  
PROPYLENE AND PROPYLENE-D SUB 6, AT VARIOUS  
DENSITIES, WERE IRRADIATED IN THE PRESENCE AND  
ABSENCE OF SCAVENGER. HIGHER MOLECULAR WEIGHT  
PRODUCTS WERE ALSO MEASURED AS A FUNCTION OF DENSITY,  
AND LIKE H<sub>2</sub> AND CH<sub>4</sub> WERE ALSO FOUND TO DECREASE  
WITH INCREASING DENSITY IN THE DENSITY RANGE 0.01 TO  
0.07 G/CC. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 677 504 7/5 7/4  
DUKE UNIV DURHAM N C DEPT OF PHYSICS

ELECTRON SPIN RESONANCE OF AN IRRADIATED SINGLE  
CRYSTAL OF DEOXYADENOSINE MONOHYDRATE, (U)

APR 68 8P LICHTER, JAMES J. ; GORDY,  
WALTER ;  
CONTRACT: AF-AFOSR-493-66  
PROJ: AF-9767  
TASK: 976702  
MONITOR: AFOSR 68-2236

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN PROCEEDINGS OF THE NATIONAL  
ACADEMY OF SCIENCES, V60 N2 P450-455 JUN 68.

DESCRIPTORS: (\*ELECTRON PARAMAGNETIC RESONANCE,  
RADIATION EFFECTS), (\*RADIATION CHEMISTRY, \*FREE  
RADICALS), CRYSTALS, ADDITION REACTIONS, RIBOSE,  
CARBOHYDRATES, ADENINE, DEUTERIUM (U)

A SINGLE CRYSTAL OF DEOXYADENOSINE MONOHYDRATE  
GROWN FROM D2O HAS BEEN GAMMA-IRRADIATED AND  
OBSERVED AT ROOM TEMPERATURE WITH AN X-BAND ESR  
SPECTROMETER. TWO STABLE FREE RADICALS WERE  
EVIDENT, ONE FORMED BY H-ADDITION ON THE ADENINE  
BASE AND THE OTHER APPARENTLY FORMED BY LOSS OF AN  
H FROM THE DEOXYRIBOSE SUGAR. STUDY HAS BEEN  
CONCENTRATED ON THE FORMER. CALCULATIONS INDICATE  
THAT H ADDITION IS POSSIBLE ON EITHER C(2) OR  
C(8) OF THE BASE RING. OUR SPECTRA INDICATE  
THAT C(2) IS THE ACTUAL SITE OF THE ADDITION.  
THE OBSERVED (14)N NUCLEAR COUPLING INDICATES  
ELECTRON SPIN DENSITIES OF 0.37 ON N(3) AND OF  
0.17 ON N(1) - IN GOOD AGREEMENT WITH  
THEORETICALLY PREDICTED VALUES OF 0.38 AND 0.12 FOR A  
RADICAL FORMED BY H ADDITION ON C(2). THE  
ISOTROPIC HYPERCONJUGATIVE COUPLING TO EACH OF THE  
C(2)H2 METHYLENE PROTONS IS 43.7 PLUS OR MINUS  
0.5 G. THE NITROGEN COUPLING IS ALSO AXIALLY  
SYMMETRIC, VARYING FROM APPROXIMATELY 0 TO 20 G FOR  
N(3) AND FROM APPROXIMATELY 0 TO 8 G FOR  
N(1). (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 678 032 7/5  
AUCKLAND UNIV (NEW ZEALAND) DEPT OF CHEMISTRY

RADIOLYSIS OF NEUTRAL AQUEOUS SOLUTIONS OF CYSTEINE  
IN THE PRESENCE OF OXYGEN, (U)

MAY 68 4P PACKER, J. E. ; WINCHESTER,  
R. V. ;  
CONTRACT: AF-AFOSR-950-65  
PROJ: AF-9760  
TASK: 976002  
MONITOR: AFOSR 68-2519

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN CHEMICAL COMMUNICATIONS,  
P826-827 1968.

DESCRIPTORS: (\*RADIATION CHEMISTRY, PROTEINS),  
(\*PROTEINS, \*FREE RADICALS), SOLUTIONS(MIXTURES), OXY(U)  
IDENTIFIERS: CYSTEINE, FREE RADICAL SCAVENGERS,  
RADIOLYSIS (U)

RESULTS ARE PRESENTED AND DISCUSSED ON THE  
RADIOLYSIS OF OXYGENATED, NEUTRAL AQUEOUS SOLUTIONS  
OF CYSTEINE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 680 136 7/5 6/1  
CALIFORNIA INST OF TECH PASADENA GATES AND CRELLIN LABS  
OF CHEMISTRY

CORRELATION BETWEEN PHOTOCHEMISTRY AND HIGH-ENERGY  
RADIATION CHEMISTRY, (U)

DEC 68 11P HAMMOND, GEORGE S. ; CALDWELL,  
RICHARD A. ; KING, JOHN M. ; KRISTINSSON, HAUKUR  
; WHITTEN, DAVID G. ;  
CONTRACT: AF 49(638)-1479  
PROJ: AF-9762  
TASK: 976201  
MONITOR: AFOSR 68-2854

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN PHOTOCHEMISTRY AND  
PHOTOBIOLOGY, V7 N6 P695-703 1968.

DESCRIPTORS: (\*RADIATION CHEMISTRY,  
SOLUTIONS(MIXTURES)), (\*PHOTOCHEMICAL REACTIONS,  
SOLUTIONS(MIXTURES)), GAMMA RAYS, FREE RADICALS, IONS,  
PHOTOLYSIS, ALKENES, REACTION KINETICS, MOLECULAR  
ISOMERISM, MOLECULAR ORBITALS (U)  
IDENTIFIERS: FREE RADICAL SCAVENGERS, STILBENES (U)

THE INITIAL INTERACTIONS BETWEEN HIGH-ENERGY  
RADIATION AND A SAMPLE OF CONDENSED MATTER ARE  
COMPLEX. HOWEVER, SOON AFTER THE INITIAL PHASES  
THE EXCITATION ENERGY APPEARS IN WELL-KNOWN FORMS:  
IONS, FREE RADICALS, AND MOLECULAR EXCITED STATES.  
THESE EXCITED SPECIES ARE THE IMMEDIATE PRECURSORS  
OF THE STABLE CHEMICAL PRODUCTS. THE NATURE OF THE  
CHEMICALLY SIGNIFICANT EXCITED SPECIES CAN BE  
INFERRED BY STUDYING THE CHEMICAL CHANGES INDUCED IN  
SOLUTES WHICH HAVE BEEN WELL CHARACTERIZED IN  
PHOTOCHEMICAL STUDIES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 682 674 6/1 7/5 6/18  
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV  
OF RADIATION BIOLOGY

X- AND GAMMA-IRRADIATION OF DILUTE SOLUTIONS  
OF CHYMOTRYPSIN; THE ACTIVE INTERMEDIATE, (U)

JUN 68 9P LYNN, K. R. JORPEN, GAIL ;  
MONITOR: NRC 10411

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN INT. J. RADIAT. BIOL.,  
V14 N4 P363-371 1968. NO COPIES FURNISHED.  
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 11 MAR  
68.

DESCRIPTORS: (\*RADIATION CHEMISTRY, CHYMOTRYPSIN),  
(\*CHYMOTRYPSIN, \*ULTRAVIOLET SPECTRA), X RAYS, GAMMA  
RAYS, SOLUTIONS(MIXTURES), HYDROCHLORIC ACID, ENZYMES,  
REACTION KINETICS, ACETONES, GLUCOSE, ETHANOLS,  
PROPANOLS, FREE RADICALS, HYDROXIDES, CANADA,  
(U)CANADA (U)

X- AND GAMMA-IRRADIATION OF DILUTE AQUEOUS  
SOLUTIONS OF CHYMOTRYPSIN IN 0.001 M HCL OR IN  
WATER PRODUCE DIFFERENCE SPECTRA, OVER THE RANGE 210-  
330 M MICRONS, QUALITATIVELY SIMILAR TO THAT OBTAINED  
ON REACTION OF THE ENZYME WITH HYDROXYL RADICALS FROM  
FENTON'S REAGENT. THE PROTECTION OF THE  
ESTEROLYTIC PROPERTIES OF CHYMOTRYPSIN AGAINST  
IRRADIATION WAS MEASURED USING BTEE AS THE  
SUBSTRATE AND SODIUM FORMATE, ACETONE, GLUCOSE,  
ETHANOL AND ISO-PROPANOL AS PROTECTORS. THE  
RESULTS OBTAINED, WHEN COMBINED WITH ABSOLUTE RATE  
CONSTANTS AVAILABLE FOR REACTIONS OF THE HYDROXYL  
RADICAL, SHOW THAT RADICAL TO BE THE PREDOMINANT  
REACTIVE SPECIES IN THE IRRADIATION OF DILUTE AQUEOUS  
SOLUTIONS OF THE ENZYME. (AUTHOR) (U)

AD-A047 350

DEFENSE DOCUMENTATION CENTER ALEXANDRIA VA  
RADIATION CHEMISTRY.(U)  
NOV 77

F/G 7/5

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DDC/BIB-77/13

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2 OF 3

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A047350



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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 683 277 7/5

FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

DETECTION OF A CAPTURED ELECTRON IN IRRADIATED  
FROZEN AQUEOUS SOLUTIONS OF ALKALIS BY THE ELECTRON  
PARAMAGNETIC RESONANCE METHOD, (U)

FEB 68 14P ERSCHOV, B. G. PIKAEV, A.

K. I

REPT. NO. FTD-MT-24-10-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED MACHINE TRANS. OF  
RADIATIONNAYA FIZIKA (USSR) V4 N4 P39-47 1966.

DESCRIPTORS: (\*RADIATION CHEMISTRY, ELECTRON CAPTURE),  
(\*ELECTRON CAPTURE, SOLUTIONS(MIXTURES)), ALKALI METAL  
COMPOUNDS, PARAMAGNETIC RESONANCE, IONIZATION,  
PHOTOLYSIS, LINE SPECTRA, ICE, SODIUM COMPOUNDS,  
NITRATES, POTASSIUM COMPOUNDS, HYDROXIDES, USSR (U)

IDENTIFIERS: HYDRATED ELECTRONS, POLARONS, POTASSIUM  
HYDROXIDE, SODIUM NITRATES, SODIUM NITRATES,  
TRANSLATIONS (U)

IN EARLIER WORK THE HYDRATED ELECTRON PRODUCED BY  
THE EFFECT OF IONIZING RADIATION ON WATER WAS  
DETECTED WITH THE AID OF EPR. THE PRESENT STUDY  
WAS MADE ON FROZEN SOLUTIONS, FOR WHICH THE  
PROBABILITY OF THE HYDRATED ELECTRON IS THE LARGEST.  
THE EPR SOLUTIONS OF  $\text{NaNO}_3$  IRRADIATED AT  
77K, AND OF CONCENTRATED SOLUTIONS OF KOH,  
IRRADIATED AT 77K, ARE ANALYZED AND THE RADICALS  
RESPONSIBLE FOR THE DIFFERENT FINE STRUCTURE LINES  
ARE IDENTIFIED. THE MEASURED LINE WIDTHS AND THE  
CORRESPONDING G-FACTORS, AS WELL AS DATA OBTAINED BY  
OTHERS, LEAD TO THE CONCLUSION THAT IN THE RADIOLYSIS  
OF WATER AND AQUEOUS SOLUTIONS, THE PRIMARY  
RADIOLYSIS PRODUCT, WHICH HAS REDUCING PROPERTIES, IS  
THE HYDRATED ELECTRON, WHICH BECOMES STABILIZED IN  
ALKALINE SOLUTIONS AT LOW TEMPERATURES. THE  
CHARACTER OF ITS EPR SPECTRUM INDICATES THAT THE  
NEAREST NEIGHBORING OF THE ELECTRON ARE WATER  
MOLECULES AND NOT CATIONS. THE NATURE OF THE  
OBSERVED PARAMAGNETIC CENTER IS DISCUSSED IN LIGHT OF  
THESE RESULTS AND PUBLISHED DATA. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 683 493 7/4  
ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD

KINETIC STUDIES OF THE HYDRATED ELECTRON. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
FEB 69 34P KLEIN, NATHAN ; FANNING, JAMES  
E. , JR. ; SMITH, THOMAS L. ; GEPHART, HARRY N.

REPT. NO. NDL-TR-120  
PROJ: DA-1-B-062104-A-089  
TASK: 1-B-062104-A-08903

UNCLASSIFIED REPORT

DESCRIPTORS: (\*WATER, \*RADIATION CHEMISTRY),  
(\*ELECTRONS, SOLUTIONS(MIXTURES)), REACTION KINETICS, X  
RAYS, ELECTROMAGNETIC PULSES, BASES(CHEMISTRY),  
DIFFUSION (U)  
IDENTIFIERS: ELECTRONS, SOLVATES (U)

THE ULTRA-FAST, SECOND-ORDER DECAY OF THE HYDRATED  
ELECTRON,  $E(AQ)(-)$ , FIRST OBSERVED FOLLOWING  
NANOSECOND X-RAY PULSES IN AIR-FREE, ALKALINE  
SOLUTION, HAS BEEN STUDIED IN GREATER DETAIL. THE  
ADDITION OF ALKALI HALIDE SALTS IN LOW CONCENTRATION  
STRONGLY INFLUENCES THE KINETIC BEHAVIOR OF THE  
REACTION, AND IT IS SUGGESTED THAT  $E(AQ)(-)$   
REACTS WITH A POSITIVE ION, TENTATIVELY ASSIGNED THE  
FORMULA  $H_2O(+)$ . THE EFFECT OF STRUCTURE ON  
REACTIVITY IS DISCUSSED AND METHODS OF CHARGE  
TRANSFER AND ENERGY MIGRATION IN SOLUTION ARE  
REVIEWED. THE POSSIBLE EXISTENCE OF A WANNIER  
EXCITON IN THESE SOLUTIONS IS SUGGESTED.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 683 534 7/5 11/9  
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

INVESTIGATION OF THE EFFECT OF GAMMA-RADIATION ON  
THE PROCESS OF OXIDATION OF POLYETHYLENE AS  
DETERMINED BY INFRARED SPECTROSCOPY, (U)

NOV 68 10P NARZULLAEV, B. N. ; KORODENKO,  
G. D. ; KARIMOV, S. N. ; MARUPOV, P. ;  
REPT. NO. FTD-HT-23-1103-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF AKADEMIYA NAUK  
TADZHIKSKOI SSR, DUSHANBE. DOKLADY, V10 N3 P21-24  
1967, BY D. KOOLBECK.

DESCRIPTORS: (\*POLYETHYLENE PLASTICS, \*RADIATION  
CHEMISTRY), GAMMA RAYS, OXIDATION, USSR, FREE RADICALS,  
INFRARED SPECTROSCOPY (U)  
IDENTIFIERS: TRANSLATIONS (U)

POLYETHYLENE 100 MICRONS THICK WAS IRRADIATED USING  
A 60CO SOURCE TO A DOSE OF 10 TO THE 5TH POWER TO 4  
X 10 TO THE 8TH POWER RADS. THE SAMPLE WAS KEPT  
UNDER VACUUM FOR 20 DAYS AND EXPOSED TO THE AIR FOR 5  
DAYS. THE IR SPECTRUM WAS DETD. AND ANALYZED, AND  
GRAPHICAL REPRESENTATIONS ILLUSTRATING THE DEPENDENCE  
OF THE OPTICAL DENSITY OF THE BANDS AT 1720, 1465,  
1375, AND 965/CM ON THE DOSE ARE SHOWN. A  
MECHANISM TO ACCOUNT FOR THE PROCESSES OF DEGRADATION  
AND LOSS OF CRYSTALLINITY IS SUGGESTED. (AUTHOR)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 684 378 7/5  
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

ALL-UNION CONFERENCE ON THE APPLICATION OF  
RADIOACTIVE AND STABLE ISOTOPES AND RADIATION IN THE  
NATIONAL ECONOMY AND SCIENCE. ISOTOPES AND  
RADIATION IN CHEMISTRY. TRANSACTIONS. 1957  
(SELECTED ARTICLES). (U)

NOV 68 94P  
REPT. NO. FTD-HT-23-688-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF MONO. VSESOYUZNAYA  
KONFERENTSIYA PO PRIMENENIYU RADIOAKTIVNYKH I  
STABILNYKH IZOTOPOV I IZLUCHENII V NARODNOM  
KHOZYAISTVE I NAUKE. IZOTOPY I IZLUCHENIYA V  
KHIMII, 1957 TRUDY, MOSCOW, 1958 P85-140.

DESCRIPTORS: (\*RADIATION CHEMISTRY, SYMPOSIA),  
IONIZATION, SOLUTIONS(MIXTURES), URANIUM COMPOUNDS,  
ALPHA PARTICLES, GAMMA RAYS, OXIDATION, POLYMERS,  
BROMINE, WATER, POLYMERIZATION, USSR, RADIOACTIVE  
ISOTOPES, STABLE ISOTOPES (U)  
IDENTIFIERS: PENTANE, TRANSLATIONS (U)

THE RADIATION CROSSLINKING OF POLYETHYLENE,  
POLYMETHYLSILOXANE AND OTHER POLYMERS WAS STUDIED.  
THE STUDIES ON THE MECHANISM OF CROSSLINKING OF  
POLYETHYLENE INDICATE THAT THE CROSSLINKING PROCESS  
TAKES PLACE MAINLY AS A RESULT OF THE SIMULTANEOUS  
DETACHMENT OF TWO HYDROGEN ATOMS IN NEIGHBORING  
MOLECULES AS A RESULT OF SINGLE PRIMARY EVENT. THE  
STUDY OF THE IRRADIATED POLYMETHYLSILOXANE HAS SHOWN  
THAT THE PART OF THE POLYMER WHICH CRYSTALLIZES AT -  
40-50C DECREASES IN PROPORTION TO THE RADIATION  
DOSE. A COMPARATIVE STUDY OF THE PROCESS OF  
RADIATION VULCANIZATION OF NATURAL AND SYNTHETIC  
RUBBER WAS MADE. IT WAS SHOWN THAT CERTAIN  
ADDITIVES RETARD RADIATION VULCANIZATION, WHILE  
OTHERS ACCELERATE IT SOMEWHAT. (AUTHOR, MODIFIED-  
PL) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 684 437 7/5 13/2  
NAVAL RESEARCH LAB WASHINGTON D C

THE INTERACTION OF RADON DECAY PRODUCTS WITH  
AEROSOLS.

(U)

DESCRIPTIVE NOTE: INTERIM REPT.,  
DEC 68 26P SAUNDERS, A. W. , JR.;  
PATTERSON, R. L. , JR.; LOCKHART, L. B. , JR;

REPT. NO. NRL-6802  
PROJ: RR-001-05-42-4851

UNCLASSIFIED REPORT

DESCRIPTORS: (\*AIR POLLUTION, \*AEROSOLS), (\*RADIATION  
CHEMISTRY, AEROSOLS), RADON, RADIOACTIVE DECAY,  
PHTHALATES

(U)

IDENTIFIERS: DOP, PHTHALATE/DIOCTYL, SMOG

(U)

AN INSTRUMENTED PLASTIC CHAMBER WAS CONSTRUCTED AND USED TO STUDY THE STABILITY OF SOME SUBMICRON DIOCTYL PHTHALATE (D.O.P.) AEROSOLS AND THEIR INTERACTION WITH THE SHORT-LIVED RADIOACTIVE DECAY PRODUCTS OF RADON (222RN). THE DEGREE OF ATTACHMENT OF THE RADON DECAY PRODUCTS TO THE D.O.P. AEROSOLS IN THIS CHAMBER HAS BEEN SHOWN TO BE A FUNCTION OF THE RELATIVE AREAS OF THE AEROSOL AND WALL SURFACES. AT HIGH AEROSOL CONCENTRATIONS (100,000 PARTICLES/CU CM), 90% OR MORE OF THE SHORT-LIVED DECAY PRODUCTS ARE ATTACHED TO AEROSOL PARTICLES. AT LOWER AEROSOL CONCENTRATIONS AND PARTICULARLY WHEN CONVECTION INCREASES THE AVAILABILITY OF THE WALLS FOR DEPOSITION, THE AIRBORNE RADIOACTIVITY IS MUCH LESS. UNDER THE PROPER CONDITIONS APPRECIABLE QUANTITIES OF UNATTACHED RADON DESCENDANTS WILL REMAIN AIRBORNE. A FEW PRELIMINARY STUDIES WITH THESE 'FREE' ATOMS OR SIMPLE MOLECULES HAVE SHOWN THAT THEY ARE EFFECTIVELY RETAINED BY FIBROUS FILTERS. THEY THUS PROVIDE A USEFUL TOOL FOR EVALUATING THE RETENTIVITY OF FILTER MEDIA TOWARD EXTREMELY SMALL PARTICLES AND FOR STUDYING THE MECHANISM OF PARTICLE CAPTURE THROUGH DIFFUSIVE PROCESSES. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 684 487 7/5 11/5  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D  
C

NEW FIBER-FORMING POLYAMIDES, (U)

MAR 69 10P FEDOTOVA, O. YA. ;SHTILMAN,  
M. I. ;KOLESNIKOV, G. S. ;  
REPT. NO. FSTC-HT-23-665-68  
PROJ: FSTC-92236282301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF KHIMICHESKIE VOLOKNA  
(USSR) V10 P5-7 1968.

DESCRIPTORS: (\*POLYAMIDE PLASTICS, \*SYNTHETIC FIBERS),  
(\*RADIATION CHEMISTRY, POLYAMIDE PLASTICS),  
SYNTHESIS(CHEMISTRY), GAMMA RAYS, CARBOXYLIC ACIDS,  
DIENES, AMINES, HYDROCARBONS, ETHYLENEDIAMINE, USSR (U)  
IDENTIFIERS: POLYAMIDE FIBERS (U)

POLYAMIDES HAVE BEEN OBTAINED IN YIELDS OF 92-95%  
FROM THE UNSATURATED 6-DODECENE-1, 12-DICARBOXYLIC  
AND 6, 10-HEXADECADIENE DICARBOXYLIC ACID SETHYLENE  
DIAMINE, HEXAMETHYLENE DIAMINE AND DECAMETHYLENE  
DIAMINE. THE POLYAMIDE FROM 6-DODECENE-1, 12-  
DICARBOXYLIC ACID AND HEXAMETHYLENE DIAMINE YIELDS  
FIBER WHICH AFTER IRRADIATION WITH GAMMA RAYS FROM  
CO-60 AT A DOSE RATE OF 2.7 MRAD/HR., SHOWED A  
BREAKING STRENGTH OF UP TO 33.1 RKM AND AN ELONGATION  
OF 23%, COMPARED WITH VALUES OF 20.3 RKM AND 25%  
FOR THE UNIRRADIATED FIBER. (AUTHOR-PL) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 685 099 7/5 7/3  
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO  
IONIC REACTIONS IN ETHYL CHLORIDE, (U)  
JAN 68 34P TIERNAN, THOMAS O. ; HUGHES,  
B. MASON ;  
REPT. NO. ARL-68-0195  
PROJ: AF-7023  
TASK: 702300

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN ADVANCES IN CHEMISTRY  
SERIES, N82 P412-440 1968.

DESCRIPTORS: (\*HALOGENATED HYDROCARBONS, \*IONIZATION),  
(\*RADIATION CHEMISTRY, HALOGENATED HYDROCARBONS),  
(\*PHOTOLYSIS, HALOGENATED HYDROCARBONS), MASS  
SPECTROSCOPY (U)  
IDENTIFIERS: \*ETHYL CHLORIDE, ETHANE, ION MOLECULE  
INTERACTIONS, RADIOLYSIS (U)

ION-MOLECULE REACTIONS IN GASEOUS ETHYL CHLORIDE  
ARE IDENTIFIED BY DETAILED MASS SPECTROMETRIC  
INVESTIGATION. THE MAJORITY OF THESE REACTIONS  
LEAD ULTIMATELY TO A SINGLE UNREACTIVE IONIC PRODUCT,  
 $C_2H_5OCl^+$ , WHICH CONSTITUTES ABOUT 70% OF  
THE TOTAL IONIC YIELD AT A SYSTEM PRESSURE OF 1000  
MICRONS. FROM THE RADIOLYSIS PRODUCTS OF ETHYL  
CHLORIDE AND OF ETHYL CHLORIDE WITH VARIOUS  
ADDITIVES, THE IONIC FRAGMENTATION SCHEME IS DEDUCED  
AT THE HIGHER PRESSURES USED. ION-SCAVENGING  
TECHNIQUES ARE USED TO CHARACTERIZE UNREACTIVE IONS  
IN THE RADIOLYSIS SYSTEM. THE PRODUCT DISTRIBUTION  
RESULTING FROM EXCITED ETHYL CHLORIDE MOLECULE  
DECOMPOSITION IS DERIVED FROM RELATED PHOTOLYSIS  
STUDIES AND IS USED IN CONJUNCTION WITH DATA OBTAINED  
FOR THE OTHER REACTION PROCESSES TO CONSTRUCT A  
COMPLETE MECHANISM FOR THE RADIOLYTIC DECOMPOSITION.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 685 359 7/5 7/4

CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY

INTRAMOLECULAR ELECTROSTATIC ELECTRON TRAPS, (U)

SEP 68 6P MITTAL, JAI P. ; LIBBY, W.

F. ;

CONTRACT: AF-AFOSR-245-65

PROJ: AF-9710

TASK: 971003

MONITOR: AFOSR 69-0859TR

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN NATURE, V220 N5171 P1027-1028,  
7 DEC 68.

SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 19 AUG  
68.

DESCRIPTORS: (\*HALOGENATED HYDROCARBONS, \*ELECTRON  
CAPTURE), (\*RADIATION CHEMISTRY, \*ELECTRONS), FLUORINE  
COMPOUNDS, FURANS, GAMMA RAYS, CYCLOBUTANES,  
CYCLOHEXANES, CYCLOOCTANES (U)

IDENTIFIERS: CYCLOHEXANE/DODECAFLURO, CYCLOBUTANE/  
OCTAFLURO, ELECTRON TRAPS, FLUORINE ORGANIC  
COMPOUNDS (U)

CYCLIC FLUOROCARBONS ARE SHOWN TO CAPTURE LOW  
ENERGY ELECTRONS READILY WHILE THE ANALOGOUS STRAIGHT  
CHAIN COMPOUNDS DO NOT. IT IS SUGGESTED THAT THE  
CAUSE IS AN ELECTROSTATIC POTENTIAL WELL IN THE  
CYCLIC COMPOUNDS WHICH IS MADE BY THE NEGATIVE  
FLUORINES WHICH CANNOT EXIST IN THE STRAIGHT CHAINS  
SINCE THEY DO NOT CLOSE. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 685 402 6/18 6/1 7/5  
ARMY BIOLOGICAL LABS FREDERICK MD

APPLICATION OF THE HIGH-FREQUENCY ELECTRICAL  
CONDUCTIVITY METHOD FOR THE STUDY OF ADSORPTION  
PROPERTIES OF IRRADIATED PROTEINS, (U)

69 9P TKACH, V. K. ; FRENKEL, L.

A. ;  
REPT. NO. TRANS-2411

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF UNIDENTIFIED RUSSIAN  
LANGUAGE ARTICLE, P824-829, N.D.

DESCRIPTORS: (\*PROTEINS, ADSORPTION), (\*RADIATION  
CHEMISTRY, PROTEINS), ELECTRICAL CONDUCTIVITY,  
SOLUTIONS(MIXTURES), DESIGN, SENSITIVITY, ELECTRIC  
FIELDS, IONS, CIRCUITS, DIAGRAMS, RADIATION EFFECTS,  
RADIATION DOSAGE, BLOOD PROTEINS, USSR (U)  
IDENTIFIERS: TRANSLATIONS (U)

THE METHOD DEvised BY THE AUTHOR MAKES IT POSSIBLE  
TO ESTIMATE THE ADSORPTIVE PROPERTIES OF PROTEINS BY  
DETERMINING THE TEMPERATURE COEFFICIENTS OF THE HIGH-  
FREQUENCY ELECTRICAL CONDUCTIVITY OF THEIR SOLUTIONS.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 20M07

AD- 687 654 7/5 6/1  
DEFENSE RESEARCH ESTABLISHMENT OTTAWA (ONTARIO)

GAMMA-RADIOLYSIS OF DISULFIDES IN AQUEOUS  
SOLUTION. II. D-PENICILLAMINE DISULFIDE, (U)

JUL 68 9P PURDIE, J. W. ;  
REPT. NO. DREO-572

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN CANADIAN JNL. OF  
CHEMISTRY, V47 NO P1029-1036 1969. NO COPIES  
FURNISHED.

SUPPLEMENTARY NOTE: PRESENTED AT ANNUAL MEETING OF  
RADIATION RESEARCH SOCIETY (15TH), SAN JUAN,  
PUERTO RICO, MAY 67. SEE ALSO AD-687 655.

DESCRIPTORS: (\*SULFIDES, \*RADIATION CHEMISTRY), FREE  
RADICALS, AMINO ACIDS, ORGANIC SULFUR COMPOUNDS, CANA(U)  
IDENTIFIERS: CYSTEINE SULFUR COMPLEXES, DISULFIDE  
LINKAGES, MERCAPTANS, NITROGEN OXIDE(N2O),  
PENICILLAMINE SULFUR COMPLEXES, RADICAL SCAVENGERS,  
RADIOLYSIS (U)

THE GAMMA-RADIOLYSIS OF D-PENICILLAMINE DISULFIDE  
(PENSSPEN) IN AN AQUEOUS SOLUTION HAS BEEN  
STUDIED UNDER AERATED AND DEAERATED CONDITIONS. G  
VALUES WERE DETERMINED FOR THE FOLLOWING PRODUCTS:  
PENICILLAMINE SULFINIC ACID (PENSO2H),  
PENICILLAMINIC ACID (PENSO3H), BETA-  
HYDROXYVALINE (PENOH), 2-AMINO-3-METHYLBUT-3-  
ENOIC ACID (HOOC.CH(NH2).C(CH3)=CH2),  
PENICILLAMINE (PENSH), PENICILLAMINE DISULFIDE-  
S-MONOXIDE (PENS(O)SPEN), VALINE (PENH),  
PENICILLAMINE TRISULFIDE (PENSSSPEN), AND  
AMMONIA. THE LOW YIELD OF PENSO3H IN AERATED  
SOLUTION INDICATED THAT PENSOH DID NOT REACT WITH  
OXYGEN OR O2(-). EXPERIMENTS WITH OH  
RADICALS PRODUCED CHEMICALLY (TiCl3/H2O2)  
AND IRRADIATIONS WITH CYSTEINE OR PENICILLAMINE  
PRESENT WERE USED TO CONFIRM THESE REACTIONS.  
THESE AND THE OTHER REACTIONS WERE TESTED WITH  
RADICAL SCAVENGERS; FORMATE AND MONOCHLOROACETATE  
IONS AND NITROUS OXIDE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 687 756 7/4 7/5 11/9  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D  
C

SOME ASPECTS OF KINETICS OF SOLID PHASE  
POLYMERIZATION,

(U)

APR 69 16P KABANOV, V. A. ; PANISOV, P.  
M. ; KARGIN, V. A. ;  
REPT. NO. FSTC-HT-23-279-68  
PROJ: FSTC-92236282301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF VYSOKOMOLEKULYARNYE  
SOEDINENIYA (USSR) V8 N9 P1627-1634 1966.

DESCRIPTORS: (\*POLYMERIZATION, \*CRYSTALS), (\*RADIATION  
CHEMISTRY, POLYMERIZATION), REACTION KINETICS (U)  
IDENTIFIERS: TRANSLATIONS (U)

SOLID PHASE POLYMERIZATION IS CONSIDERED AS A  
NONEQUILIBRIUM PHASE TRANSFORMATION: CRYSTALLINE  
MONOMER - POLYMER. AN EXPRESSION IS OBTAINED FOR  
THE DIMENSION OF THE CRYSTALLINE SEED OF THE POLYMER  
PHASE WITH THE ASSUMPTION THAT IT REPRESENTS  
MACROMOLECULES WHICH ARE PACKED IN PARALLEL. THE  
NOTION WAS PUT FORTH THAT THE S-SHAPED FORM OF THE  
KINETIC CURVES OF SOLID PHASE POLYMERIZATION IS  
CONNECTED WITH THE SLOW GENERATION AND FOLLOWING  
RAPID DEVELOPMENT OF THE POLYMER PHASE. THE  
HYPOTHESIS WAS PUT FORTH THAT UNDER THE INFLUENCE OF  
RADIATIONS OF HIGH ENERGY ON THE CRYSTALLINE  
MONOMER, 'HOT' AREAS ARE CREATED IN THE CRYSTALLINE  
MONOMER IN WHICH POLYMER CHAINS MAY CONTINUE TO GROW  
AND WHICH WILL TURN OUT TO BE THERMODYNAMICALLY  
UNSTABLE WHEN THESE 'HOT' AREAS ARE 'COOLED'; A  
FURTHER EFFECT OF RADIATION MAY BE CAUSED BY THE  
CHAIN DECAY OF THESE UNSTABLE MOLECULES TO THE  
MONOMER STATE. IT WAS SHOWN THAT THE FORMATION OF  
THERMODYNAMICALLY UNSTABLE CHAINS IN THE CRYSTAL OF  
THE MONOMER, ACCOMPANYING THEIR FORMATION BY  
'ANNEALING' AND THEN BY 'USUAL' POLYMERIZATION, MAY  
BE IN A NUMBER OF CASES THE REASON FOR THE  
COMPLICATED CHARACTER OF THE KINETICS OF SOLID PHASE  
POLYMERIZATION UNDER THE EFFECT OF RADIATION.

(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 690 948 7/5 7/3  
CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY

POLYMER PRODUCTION IN THE GAMMA RADIOLYSIS OF  
METHANE IN LIQUID ARGON, (U)

SEP 68 5P HAMLET, PETER ; MOSS, JEFFREY ;  
MITTAL, JAI P. ; LIBBY, W. F. ;  
CONTRACT: AF-AFOSR-1255-67  
PROJ: AF-9538  
MONITOR: AFOSR 69-1814TR

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF THE AMERICAN  
CHEMICAL SOCIETY, V91 N P258-260, 15 JAN 69.

DESCRIPTORS: (\*METHANE, \*RADIATION CHEMISTRY),  
(\*POLYMERIZATION, METHANE), SOLIDIFIED GASES, GAMMA  
RAYS, POLYMERS (U)  
IDENTIFIERS: AUGER ELECTRONS, RADIOLYSIS (U)

GAMMA RADIOLYSIS OF METHANE PRODUCES A POLYMER  
WHICH IN THE CONDENSED PHASE HAS AN AVERAGE MOLECULAR  
FORMULA  $C_{20}H_{40}$ . AN ATTEMPT TO STUDY THE  
MECHANISM WAS MADE BY USING THE IONIZATION CAUSED BY  
ELECTRON TRANSFER FROM METHANE TO ARGON IONS IN  
LIQUID ARGON. THE GAMMA RADIOLYSIS OF LIQUID  
ARGON-METHANE SOLUTIONS SHOWED THAT IN MIXTURES  
CONTAINING AS LITTLE AS 0.15 MOLE % METHANE, A  
POLYMER AVERAGING  $C_{22}H_{42}$  WAS PRODUCED WITH A G  
VALUE 11 TIMES THAT FOR THE POLYMER FROM PURE  
METHANE. THIS G VALUE IS CALCULATED ON TOTAL  
ENERGY ABSORBED BY THE SAMPLE. IT IS SUGGESTED  
THAT THE POLYMER IS FORMED BY CONDENSATION OF THE  
DENSE BLOB OF METHANE FRAGMENTS WHICH COULD BE FORMED  
BY AUGER ELECTRONS EMITTED FOLLOWING INNER-SHELL  
IONIZATION. THIS IONIZATION WOULD BE HIGHLY  
LOCALIZED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 691 138 7/5 20/12  
NORTH CAROLINA STATE UNIV RALEIGH PHYSICAL SCIENCE  
RESEARCH

EFFECTS OF 60CO GAMMA IRRADIATION UPON YVO<sub>4</sub>,  
YVO<sub>4</sub>:EU(3+), AND YVO<sub>4</sub>:NO(3+). (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JUN 69 79P SMITH, BENNETT MICHAEL ;  
CONTRACT: DAAH01-67-C-1456

UNCLASSIFIED REPORT

DESCRIPTORS: (\*YTTRIUM COMPOUNDS, \*FLUORESCENCE),  
(\*IRRADIATION CHEMISTRY, YTTRIUM COMPOUNDS), (\*VANADATES,  
FLUORESCENCE), DOPING, GAMMA RAYS, SINGLE CRYSTALS,  
EUROPIUM, IONIZATION, ULTRAVIOLET SPECTRA, VISIBLE  
SPECTRA, MOLECULAR ENERGY LEVELS, CRYSTAL DEFECTS,  
NEODYMIUM (U)  
IDENTIFIERS: GAMMA RAYS, IRRADIATION, HOLES(ELECTRON  
DEFICIENCIES), YTTRIUM VANADATE (U)

THE ABSORPTION AND FLUORESCENT SPECTRA OF SINGLE  
CRYSTALS OF YVO<sub>4</sub>, YVO<sub>4</sub>:EU(3+) ARE DISCUSSED  
AND ILLUSTRATED, AND THE EFFECTS OF 60CO GAMMA  
IRRADIATION UPON THE SPECTRA ARE PRESENTED.  
IRRADIATION PRODUCED SIMILAR CHANGES IN THE  
ABSORPTION COEFFICIENT OF THESE CRYSTALS. SMALL  
CENTER BANDS WERE FORMED IN THE ULTRAVIOLET AND  
VISIBLE REGIONS. THE INTENSITY OF THE FLUORESCENT  
EMISSION FROM BOTH YVO<sub>4</sub> AND YVO<sub>4</sub>:EU(3+) WAS  
DECREASED BY IRRADIATION, WHILE THE EMISSION  
INTENSITY OF YVO<sub>4</sub>:ND(3+) WAS NOT AFFECTED.  
SPECULATIONS ABOUT THE NATURE OF THE MECHANISMS  
PRODUCING THE IRRADIATION EFFECTS DISCUSSED. GAMMA  
IRRADIATION PRODUCES IONIZATION IN CRYSTALS, AND SOME  
OF THE FREE ELECTRONS AND HOLES CREATED BECOME  
TRAPPED AT LATTICE DEFECTS. THE CHANGES IN  
EMISSION AND ABSORPTION IN THE YVO<sub>4</sub> CRYSTALS ARE  
INTERPRETED AS DUE TO THE TRAPPED HOLES AND  
ELECTRONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 691 327 7/5 18/4  
ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD

HYDROGEN AND HYDROGEN PEROXIDE PRODUCED BY GAMMA  
RADIOLYSIS OF OXYGEN-SATURATED WATER, (U)

JUN 69 38P SASSE, RONALD A. ;  
REPT. NO. NDL-TR-122  
PROJ: DA-1-B-062104-A-089  
TASK: 1-B-062104-A-08903

UNCLASSIFIED REPORT

DESCRIPTORS: (\*RADIATION MEASURING INSTRUMENTS, WATER),  
(\*WATER, \*RADIATION CHEMISTRY), (\*HYDROGEN PEROXIDE,  
RADIATION CHEMISTRY), DAMAGE, RADIATION EFFECTS,  
HYDROGEN, IONIZATION, GAMMA RAYS, OXYGEN (U)  
IDENTIFIERS: CHEMICAL REACTION MECHANISMS,  
RADIOLYSIS (U)

PURE, OXYGEN-SATURATED WATER WAS IRRADIATED WITH  
60CO GAMMA RADIATION. AT LOW DOSES,  
G(H2O2) WAS 2.6. AT DOSES GREATER THAN 2000  
RAD, G(H2O2) WAS 1.33. OVER THE ENTIRE DOSE  
INTERVAL G(H2) WAS CONSTANT AT 0.17. THE G  
VALUES OF 1.33 AND 0.17 AGREE WITH PUBLISHED DATA.  
MANY EXPERIMENTS ARE PRESENTED TO FORM THE ARGUMENT  
THAT G(H2O2) = 2.6 IS NOT THE RESULT OF AN  
IMPURITY REACTION AND THAT THIS VALUE IS THE INITIAL  
YIELD. THIS HIGH G VALUE WAS MEASURED BY TWO  
DIFFERENT PURIFICATION PROCEDURES. THE RESULTS ARE  
COMPARED WITH THE PRESENTLY ACCEPTED MECHANISM FOR  
THE RADIOLYSIS OF OXYGEN-SATURATED WATER AND THE  
CONCLUSION IS REACHED THAT THIS MECHANISM IS IN ERROR  
AT LEAST IN THE LOW DOSE RANGE. ANOTHER MECHANISM  
IS DEVELOPED TO ACCOUNT FOR THE EXPERIMENTAL RESULTS  
WHERE H2O(+) AND E(-) ARE PROPOSED AS THE  
PRIMARY SPECIES IN THE RADIOLYSIS OF WATER.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 692 106 7/5  
NEWCASTLE-UPON-TYNE UNIV (ENGLAND) DEPT OF ORGANIC  
CHEMISTRY

ORGANIC RADIATION CHEMISTRY. (U)

DESCRIPTIVE NOTE: FINAL REPT. OCT 64-APR 69,  
MAY 69 37P SWAN, G. A. IFAYADH, J. M.

CONTRACT: AF 61(052)-773  
PROJ: AF-7360  
TASK: 736003  
MONITOR: AFML TR-69-137

UNCLASSIFIED REPORT

DESCRIPTORS: (\*AMINES, \*RADIATION CHEMISTRY),  
(\*PHOTOLYSIS, AMINES), (\*QUINOLINES, RADIATION  
CHEMISTRY), GAMMA RAYS, IONS, FREE RADICALS, NUCLEAR  
MAGNETIC RESONANCE, ALKENES, PIPERIDINES, PEROXIDES,  
NITROGEN HETEROCYCLIC COMPOUNDS, SYNTHESIS(CHEMISTRY),  
GREAT BRITAIN (U)

IDENTIFIERS: ANILINE/N-N-DIMETHYL, \*ANILINES,  
QUINOLINEMETHANOL ANTIMALARIALS, QUINOLINE-3-4-  
DICARBOXIMIDE COMPOUNDS, \*RADIOLYSIS, TERTIARY  
AMINES (U)

GAMMA-RADIOLYSIS OF PURE NN-DIMETHYLANILINE  
YIELDS NN'-DIMETHYL-NN'-DIPHENYLETHYLENEDIAMINE  
(THROUGH DIMERISATION OF THE N-  
METHYLANILINOMETHYL RADICAL) TOGETHER WITH  
HYDROGEN, METHANE, AND N-METHYLANILINE; BUT WHEN  
THE RADIOLYSIS IS CARRIED OUT IN THE PRESENCE OF ACID  
THE FIRST NAMED PRODUCT IS REPLACED BY N-P-  
DIMETHYLAMINOBENZYL-N-METHYLANILINE AND/OR 4,4'-  
BISDIMETHYLAMINODIPHENYLMETHANE, FORMED VIA THE ION  
(PHNME:CH2)+. THE TWO LATTER PRODUCTS ARE  
ALSO FORMED BY PHOTOLYSIS OF THE AMINE IN THE  
PRESENCE OF ACID. GAMMA-RADIOLYSIS OF NN-  
DIMETHYL-P-TOLUIDINE GIVES NN'-DIMETHYL-NN'-DI-P-  
TOLYLETHYLENEDIAMINE AND 4,4'-  
BISDIMETHYLAMINOBIBENZYL. GAMMA-IRRADIATION OR  
PHOTOLYSIS OF NN-DIMETHYLANILINE IN THE PRESENCE OF  
N-PHENYLMALIMIDE YIELDS 1,2,3,4-TETRAHYDRO-1-  
METHYLQUINOLINE-3,4-DICARBOXYLIC-N-PHENYLIMIDE,  
THROUGH A RADICAL REACTION. A SIMILAR REACTION  
OCCURS WITH OTHER NN-DIALKYLANILINES, N-  
PHENYLPYRROLIDINE, OR N-PHENYLPYPERIDINE IN THE  
PRESENCE OF OLEFINIC COMPOUNDS SUCH AS N-  
PHENYLMALIMIDE, DIETHYL MALEATE, CYCLOHEXENE, OR  
CYCLOPENTENE. (AUTHOR) (U)

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Z0M07

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 692 455 7/4  
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

TEMPERATURE DEPENDENCE OF THE ELECTRON SPIN  
RESONANCE SPECTRUM OF THE CH<sub>2</sub>CO<sub>2</sub> (-) RADICAL  
FORMED IN X-IRRADIATED ZINC ACETATE  
DIHYDRATE.

(U)

DESCRIPTIVE NOTE: MASTER'S THESIS,  
JUN 69 134P HUNT, JOHN WOODROW ;

UNCLASSIFIED REPORT

DESCRIPTORS: (\*ACETATES, \*ELECTRON PARAMAGNETIC  
RESONANCE), (\*RADIATION CHEMISTRY, ELECTRON PARAMAGNETIC  
RESONANCE), X RAYS, FREE RADICALS, THESES (U)  
IDENTIFIERS: CARBON CARBON BONDING, METHYLENE  
RADICALS, ZINC ACETATE (U)

A DECREASE OF ONE TO SIX GAUSS (DEPENDING ON  
MAGNETIC FIELD ORIENTATION) IN THE COUPLING  
CONSTANTS OF THE CH<sub>2</sub>CO<sub>2</sub>(-) RADICAL FORMED IN  
X-IRRADIATED ZINC ACETATE DIHYDRATE HAS BEEN  
OBSERVED OVER A TEMPERATURE RANGE OF ABOUT -60C TO  
+30C. CALCULATIONS OF DIPOLAR AND FERMI  
CONTACT INTERACTION BASED ON A MODEL OF INTERNAL  
ROTATION OF THE METHYLENE GROUP ABOUT THE C-C  
BOND HAVE SHOWN A SMALL COUPLING CONSTANT DECREASE ON  
THE ORDER OF 0.19 GAUSS OVER A TEMPERATURE RANGE OF -  
150C TO +90C. THE MAJOR EFFECT HAS BEEN  
SHOWN TO BE DUE TO A SPIN RELAXATION MECHANISM.  
THE EFFECT WAS CALCULATED USING MONTE CARLO  
TECHNIQUES, THE RESULTS OF WHICH WERE CONFIRMED BY  
EXPERIMENTAL DATA. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 692 671 7/5 11/9  
COLUMBIA UNIV NEW YORK DEPT OF CHEMICAL ENGINEERING

DIFFUSIONAL EFFECTS IN RADIATION-INDUCED GRAFT  
POLYMERIZATION, (U)

67 19P ODIAN, GEORGE ; KRUSE, ROBERT

L. ;  
CONTRACT: DA-ARO(D)-31-124-6716  
MONITOR: AROD 5764:1-C

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. POLYMER SCI., P1-13  
N.D.

SUPPLEMENTARY NOTE: PRESENTED AT THE INTERNATIONAL  
SYMPOSIUM ON MACROMOLECULAR CHEMISTRY, BRUSSELS,  
JUN 67.

DESCRIPTORS: (\*RADIATION CHEMISTRY, \*COPOLYMERIZATION),  
(\*STYRENES, COPOLYMERIZATION), (\*ACRYLONITRILE POLYMERS,  
COPOLYMERIZATION), POLYMERIZATION, POLYETHYLENE  
PLASTICS, DIFFUSION, MATHEMATICAL ANALYSIS, FILMS, GAMMA  
RAYS (U)

IDENTIFIERS: ACRYLONITRILE COPOLYMERS, COPOLYMERS,  
\*GRAFT POLYMERIZATION, STYRENE COPOLYMERS (U)

VARIOUS THEORETICAL EQUATIONS HAVE BEEN DERIVED TO  
SHOW THE EFFECTS OF DIFFUSION ON STEADY-STATE  
RADIATION-INDUCED GRAFT POLYMERIZATION. THE  
THEORETICAL RELATIONSHIPS DESCRIBE THE EFFECTS OF  
DIFFUSION ON THE GRAFTING REACTION IN TERMS OF THE  
CHANGE IN THE REACTION FROM VOLUMETRIC TO SURFACE  
GRAFTING, THE EFFECT OF POLYMER FILM THICKNESS ON THE  
RATE OF GRAFTING AND THE ORDER OF THE DEPENDENCE OF  
THE RATE ON THE RADIATION INTENSITY. A  
MATHEMATICAL ANALYSIS IS PRESENTED IN TERMS OF THE  
QUANTITATIVE INTERRELATIONSHIPS OF THE QUANTITIES, I  
(THE RADIATION INTENSITY), D (THE DIFFUSIVITY OF  
THE MONOMER IN THE POLYMER), AND L (THE POLYMER  
FILM THICKNESS). THE THEORETICAL EQUATIONS SHOW  
THE EXACT MANNER IN WHICH THESE QUANTITIES INTERACT  
TO DETERMINE THE GRAFTING RATE. EXPERIMENTAL DATA  
ARE PRESENTED FOR THE GRAFT POLYMERIZATION OF  
STYRENE-ACRYLONITRILE TO HIGH DENSITY POLYETHYLENE  
FILMS OF 1.1 TO 40 MILS THICKNESS AT DOSE RATES FROM  
0.005 TO 8.5 MRADS/HR. THE EXPERIMENTAL RESULTS  
ARE SHOWN TO CONFIRM THE THEORETICAL RELATIONSHIPS  
QUITE WELL. THE UTILITY OF THESE PLOTS IS  
DISCUSSED AS IS THE APPLICABILITY OF THE DERIVED  
THEORETICAL RELATIONSHIPS TO ALL GRAFTING SYSTEMS.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 692 673 7/5 11/9  
COLUMBIA UNIV NEW YORK DEPT OF CHEMICAL ENGINEERING

MONOMER REACTIVITY RATIOS IN RADIATION GRAFT  
COPOLYMERIZATION, (U)

68 8P ODIAN, GEORGE ; KRUSE, ROBERT

L. ;  
CONTRACT: DA-ARO(D)-124-6716  
MONITOR: AR0D 5764:3-C

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN POLYMER PREPRINTS, V9 N1  
P668-674 APR 68.

DESCRIPTORS: (\*RADIATION CHEMISTRY, \*COPOLYMERIZATION),  
(\*STYRENES, COPOLYMERIZATION), (\*ACRYLONITRILE POLYMERS,  
COPOLYMERIZATION), GAMMA RAYS, POLYMERIZATION, FREE  
RADICALS, POLYETHYLENE PLASTICS (U)  
IDENTIFIERS: ACRYLONITRILE COPOLYMERS, COPOLYMERS,  
\*GRAFT POLYMERIZATION, RADIOLYSIS (U)

THE PAPER CONCERNS THE GAMMA RADIATION-INITIATED  
GRAFT COPOLYMERIZATION OF VARIOUS PAIRS OF MONOMERS  
TO SEVERAL DIFFERENT POLYMERS. THE AUTHORS HAVE  
REEXAMINED MANY OF THE GRAFTING SYSTEMS WHICH HAVE  
BEEN REPORTED TO SHOW ANOMALOUS BEHAVIOR AND HAVE  
STUDIED A NUMBER OF NEW POLYMER-COMONOMER MIXTURE  
SYSTEMS. PARTICULAR EMPHASIS WAS PLACED ON A STUDY  
OF THE PHYSICAL NATURE OF THE MEDIA IN WHICH THE  
GRAFTING REACTION TAKES PLACE. ALMOST ALL OF THE  
PREVIOUS WORK INVOLVED POLYMER FILMS WHICH WERE  
INSOLUBLE IN THE MONOMERS ALTHOUGH IN MOST INSTANCES  
THE POLYMERS WERE SWOLLEN BY THE MONOMERS. IT WAS  
THOUGHT THAT THE HETEROGENEITY AND/OR HIGHLY VISCOUS  
NATURE OF THESE SYSTEMS MIGHT HAVE CAUSED THE  
ANOMALOUS COPOLYMERIZATION BEHAVIOR. GRAFTING  
SYSTEMS COMPOSED OF POLYMER SOLUTIONS, HIGHLY VISCOUS  
POLYMER-MONOMER MIXTURES AND INSOLUBLE POLYMER FILMS  
IMMERSED IN LIQUID MONOMERS WERE STUDIED. THE  
LATTER INCLUDES BOTH POLYMERS SWOLLEN BY MONOMER AND  
POLYMERS NOT SWOLLEN BY MONOMERS. FURTHER,  
EMPHASIS WAS PLACED ON THE ANALYTIC METHODS. ALL  
OF THE PREVIOUSLY REPORTED WORK INVOLVED ANALYSIS OF  
ONLY ONE COMPONENT IN THE GRAFTED COPOLYMER.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 693 299 7/5 7/3 11/9  
COLUMBIA UNIV NEW YORK

RADIATION EFFECTS IN POLYMERIC SYSTEMS. (U)

NOTE: FINAL REPT. 1 NOV 65-31 OCT 68,  
5P ODIAN, GEORGE ;  
CON. A-ARO(D)-31-124-6716  
MONITOR: AROD 5764:5-C

UNCLASSIFIED REPORT

DESCRIPTORS: (\*RADIATION CHEMISTRY, \*POLYMERIZATION),  
COPOLYMERIZATION, CROSSLINKING(CHEMISTRY), DIFFUSION,  
POLYETHYLENE PLASTICS, STYRENE PLASTICS, ACETONITRILE(U)  
IDENTIFIERS: \*GRAFT POLYMERIZATION (U)

THE INVESTIGATION OF RADIATION INDUCED  
POLYMERIZATION AND CROSSLINKING IN POLYETHYLENE/  
STYRENE-ACRYLONITRILE AND POLYTETRAFLUOROETHYLENE/  
STYRENE-ACRYLONITRILE SYSTEMS IS BRIEFLY OUTLINED.  
ALTERATIONS IN MONOMER REACTIVITIES IN GRAFT  
POLYMERIZATIONS AND THE INTERACTION OF DIFFUSION AND  
GRAFT POLYMERIZATION WERE STUDIED. (AUTHOR,  
MODIFIED-PL) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 693 419 7/5 11/9  
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

POLYMERIZATION OF N, N'-DIALLYL AMIDES IN THE  
SOLID PHASE, (U)

JUN 69 6P SHCHERBINA, F. F. ; FEDOROVA,  
I. P. ;  
REPT. NO. FTD-HT-23-1104-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF AKADEMIYA NAUK  
URSR, KIEV. DOPOVIDI. SERIYA B. GEOLOGIYA,  
GEOFIZYKA, KHIMIYA TA BIOLOGIYA, V29 N7 P639-641  
1967.

DESCRIPTORS: (\*POLYMERIZATION, \*AMIDES), (\*RADIATION  
CHEMISTRY, POLYMERIZATION), (\*POLYAMIDE PLASTICS,  
SYNTHESIS(CHEMISTRY)), FREE RADICALS, GAMMA RAYS, USS(U)  
IDENTIFIERS: TRANSLATIONS (U)

N, N-DIALLYLAMIDES OF DICARBOXYLIC ACIDS WERE  
POLYMD. IN THE SOLID STATE AT ROOM TEMP. AND UNDER  
CO IRRADN. (1060 RADS/SEC.) ALIPHATIC AMIDES  
POLYMERIZED FASTER THAN AROMATIC AMIDES. THUS  
POLYAMIDES OF N, N-DIALLYLAMIDES OF OXALIC,  
MALONIC, SUCCINIC, GLUTARIC, ADIPIC, SEBACIC, AND  
ETHYLMALONIC ACIDS WERE OBTAINED IN 86-96% YIELDS  
AND PHTHALIC, ISOPHTHALIC, AND TEREPHTHALIC ACIDS IN  
41-72% YIELDS. WITH THE EXCEPTION OF POLY(N,  
N-DIALLYLOXALAMIDE) WHICH WAS PINK, THE PREPARED  
ALIPHATIC POLYAMIDES WERE YELLOW, AND THE AROMATIC  
POLYAMIDES WERE RED-VIOLET. BY SUBSEQUENT  
IRRADIATION OF YELLOW CRYSTALLINE POLY (N, N'-  
DIALLYLMALONAMIDE) THE POLYMER BECAME BLUE,  
APPARENTLY, DUE TO THE PRESENCE OF FREE RADICALS,  
WHICH DECAYED WITH TIME. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 693 643 11/10  
ROYAL AIRCRAFT ESTABLISHMENT FARNBOROUGH (ENGLAND)

THE THERMAL STABILITY OF PHENYL CONTAINING SILICONE RUBBERS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
MAR 69 19P KAY, EDNA ;  
REPT. NO. RAE-TR-69025

UNCLASSIFIED REPORT

DESCRIPTORS: (\*RADIATION CHEMISTRY,  
\*CROSSLINKING(CHEMISTRY)), (\*SILICONES,  
CROSSLINKING(CHEMISTRY)), (\*PEROXIDES,  
CROSSLINKING(CHEMISTRY)), (\*VULCANIZATION, SILICONES),  
ELASTOMERS, THERMAL STABILITY, GAMMA RAYS, OXIDATION,  
STRESSES, VULCANIZATES, GREAT BRITAIN (U)  
IDENTIFIERS: METHYL VINYL SILICONE RUBBER, PEROXIDE/  
BIS(1'-1'-DIMETHYLBENZYL), \*SILICONES, \*SYNTHETIC  
RUBBER, STRESS RELAXATION TESTS (U)

A COMPARISON HAS BEEN MADE BETWEEN THE THERMAL STABILITIES OF PHENYL METHYL SILICONE RUBBERS CROSSLINKED BY ORGANIC PEROXIDES AND BY HIGH ENERGY IRRADIATION. THE LARGE QUANTITIES OF PEROXIDE REQUIRED TO PRODUCE PRACTICAL LEVELS OF CURE, LEAD TO REACTIONS DETRIMENTAL TO HEAT STABILITY AND THE RESULTING VULCANISATES OFFER NO ADVANTAGES OVER PEROXIDE-CURED METHYL VINYL POLYMERS. SUCH UNDESIRABLE EFFECTS CAN BE ELIMINATED BY THE USE OF IRRADIATION, WHICH, COMBINED WITH THE SUPERIOR OXIDATION RESISTANCE PROVIDED BY THE PHENYL GROUPS PRODUCE AN ELASTOMER OF OUTSTANDING HEAT STABILITY. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 693 834 7/5  
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

RADIATION-INDUCED POLYMERIZATION OF  
HEXAFLUOROPROPYLENE, (U)

JAN 69 8P SKOBINA, A. I. ; VOLKOVA, E.  
V. ;  
REPT. NO. FTU-HT-23-851-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF SIMPOZIUM.  
RADIATSIONNAYA KHIMIYA POLIMEROV, MOSCOW, 1964.  
MATERIALY (SYMPOSIUM ON RADIATION INDUCED  
POLYMERS, MOSCOW, 1964. MATERIALS) MOSCOW, 1966  
P126-128.

DESCRIPTORS: (\*RADIATION CHEMISTRY, \*POLYMERIZATION),  
(\*PROPENES, POLYMERIZATION), (\*HALOGENATED HYDROCARBONS,  
POLYMERIZATION), FLUORINE COMPOUNDS, FREE RADICALS,  
GAMMA RAYS, REACTION KINETICS, USSR (U)

IDENTIFIERS: PROPYLENE HEXAFLUORIDE, \*RADIOLYSIS,  
TRANSLATIONS (U)

THE CORRELATIONS IN THE RADIATION-INDUCED  
POLYMERIZATION OF HEXAFLUOROPROPYLENE CANNOT BE  
EXPLAINED ON THE BASIS OF THE ORDINARY CONCEPTS OF  
THE DEVELOPMENT OF THE PROCESS IN ACCORDANCE WITH THE  
RADICAL OR IONIC MECHANISM AND REQUIRE FURTHER STUDY.  
IT IS POSSIBLE THAT THE KEY ROLE IN THE  
POLYMERIZATION OF HEXAFLUOROPROPYLENE IS PLAYED BY  
THE RETARDATION OF THE PROCESS BY THE RESULTING  
POLYMERIZATION PRODUCTS AND BY THE PRODUCTS OF THEIR  
RADIOLYSIS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AL- 694 416 7/5 11/9  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D  
C

RADIATION POLYMERIZATION OF OLIGO(ETHYLENEGLYCOL-  
MALEATE-ADIPATE) WITH VARIOUS MONOMERS, (U)

SEP 69 12P OMELCHENKO, S. I. ; VIDENINA,  
N. G. ; CHERVETSOVA, I. N. ;  
REPT. NO. FSTC-HT-23-380-69  
PROJ: FSTC-9701020, FSTC-0423100

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. FROM KHMICHNA PROMYSLOVIST  
(USSR) N2 1968.

DESCRIPTORS: (\*COPOLYMERIZATION, \*RADIATION CHEMISTRY),  
(\*POLYESTER PLASTICS, COPOLYMERIZATION), VINYL PLASTICS,  
ACRYLIC RESINS, STYRENE PLASTICS, GAMMA RAYS, INFRARED  
SPECTRA, MECHANICAL PROPERTIES, USSR (U)

IDENTIFIERS: ADIPIC ACID, \*COPOLYMERS, ETHYLENE  
GLYCOL, MALEIC ACID, \*OLIGOMERS, TRANSLATIONS (U)

RADIATION COPOLYMERIZATION OF  
OLIGO(ETHYLENEGLYCOL-MALEATE-ADIPATE) WITH  
MONOMERS OF VARIOUS STRUCTURES HAS BEEN STUDIED.  
IT HAS BEEN SHOWN THAT FOR RADIATION  
COPOLYMERIZATION WITH OMAD, MONOMERS CAN BE  
ARRANGED IN A SERIES ACCORDING TO REACTION  
CAPABILITY. THE CROSS-LINKING REACTION UNDER THE  
INFLUENCE OF  $\gamma$ -RADIATION PROCEEDS MORE COMPLETELY THAN  
IN THE PRESENCE OF PEROXIDE INDICATORS. THIS IS  
CONFIRMED BY DATA FROM IR-SPECTRA, RESULTS OF  
DETERMINATION OF THE GEL-FRACTION CONTENT AND  
SPECIFIC VOLUME OF THE CONTRACTION OF THE COPOLYMERS.  
PHYSICO-MECHANICAL INDICES, THERMOSTABILITY AND  
WATER-RESISTANCE IN ALL RADIATION COPOLYMERS STUDIED  
IS HIGHER THAN IN SIMILAR COPOLYMERS OBTAINED BY THE  
THERMO-CHEMICAL METHOD. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 696 728 7/5 7/2  
SHELL DEVELOPMENT CO EMERYVILLE CALIF

LOW-TEMPERATURE RADIATION CHEMISTRY I.  
PREPARATION OF OXYGEN FLUORIDES AND DIOXYGENYL  
TETRAFLUOROBORATE, (U)

JAN 69 10P WAGNER, CHARLES D. ;  
GOETSCHEL, CHARLES T. ; CAMPANILE, VINCENT A. ;  
WILSON, J. NORTON ;  
CONTRACT: DA-31-124-ARO(D)-54  
MONITOR: AROD 4133:27-C

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF THE AMERICAN  
CHEMICAL SOCIETY, V91 N17 P4702-4707, 12 AUG 69.

DESCRIPTORS: (\*OXYGEN COMPOUNDS, SYNTHESIS(CHEMISTRY)),  
(\*FLUOBORATES, OXYGEN COMPOUNDS), (\*RADIATION CHEMISTRY,  
OXYGEN COMPOUNDS), FLUORIDES, FLUORINE, OXYGEN, CHEMICAL  
PROPERTIES, PHYSICAL PROPERTIES, BORON COMPOUNDS,  
COMPLEX COMPOUNDS (U)

IDENTIFIERS: BORON TRIFLUORIDE, DIOXYGENYL  
TETRAFLUOROBORATE, FLUORINE PEROXIDE, \*RADIOLYSIS (U)

RADIOLYSIS OF LIQUID MIXTURES OF O<sub>2</sub> AND F<sub>2</sub> AT  
77K WITH 3-MEV BREMSSTRAHLUNG PRODUCES A  
MIXTURE OF O<sub>2</sub>F<sub>2</sub> AND (O<sub>2</sub>F)<sub>n</sub> WITH POSSIBLY  
SMALL AMOUNTS OF HIGHER OXIDES. THE MIXTURE WAS  
CONVERTED TO PURE O<sub>2</sub>F<sub>2</sub> AT 195K. CONTRARY TO  
EARLIER REPORTS, PURE O<sub>2</sub>F<sub>2</sub> IS YELLOW, MELTS  
SHARPLY AT 119K, AND IS DIAMAGNETIC. INFRARED  
SPECTRA WERE OBTAINED OF THE UNPURIFIED PRODUCT AND  
OF O<sub>2</sub>F<sub>2</sub>. IN THE RADIOLYTIC SYNTHESIS, THE G  
VALUE FOR GENERATION OF F ATOMS APPEARS TO BE ABOUT  
20. DATA SUPPORT THE EXISTENCE OF O<sub>2</sub>F<sub>2</sub>,  
O<sub>2</sub>F, O<sub>4</sub>F<sub>2</sub>, AND UNKNOWN OXIDES OF HIGHER  
OXYGEN CONTENT. AS PREVIOUSLY REPORTED BY OTHERS,  
BF<sub>3</sub> REACTS WITH EITHER O<sub>2</sub>F<sub>2</sub> OR WITH MIXTURES OF  
O<sub>2</sub>F<sub>2</sub> AND SUPEROXYGEN FLUORIDES TO PRODUCE  
O<sub>2</sub>BF<sub>4</sub>; LESS STABLE COMPOUNDS SEEM TO BE PRODUCED  
FROM THE HIGHER SUPEROXIDES. THE INFRARED AND  
PARAMAGNETIC RESONANCE SPECTRA OF O<sub>2</sub>BF<sub>4</sub> HAVE BEEN  
OBTAINED; THE X-RAY POWDER PATTERN SHOWS THAT THE  
CRYSTALS ARE ORTHORHOMBIC AND ISOMORPHOUS WITH  
NOBF<sub>4</sub>. (AUTHOR) (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 698 051 7/5 11/9  
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF LOCKHEED  
RESEARCH LAB

ESR SPECTRA OF ORIENTED POLYTETRAFLUOROETHYLENE  
SUBJECTED TO 20-NSEC PULSES OF ELECTRONS, (U)

MAR 68 9P LERNER, N. R. ;

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF CHEMICAL  
PHYSICS, V50 N7 P2902-2910, 1 APR 69. NO COPIES  
FURNISHED.

DESCRIPTORS: (\*HALOCARBON PLASTICS, \*ELECTRON  
PARAMAGNETIC RESONANCE), (\*ELECTRON IRRADIATION,  
HALOCARBON PLASTICS), (\*RADIATION CHEMISTRY, HALOCARBON  
PLASTICS), DEGRADATION, FREE RADICALS, FLUORINE  
COMPOUNDS, OXIDATION, OXYGEN (U)  
IDENTIFIERS: FLUORINATED POLYMERS,  
\*TETRAFLUOROETHYLENE RESINS (U)

SAMPLES OF ORIENTED POLYTETRAFLUOROETHYLENE HAVE  
BEEN SUBJECTED TO IRRADIATION FROM A PULSED ELECTRON  
BEAM GENERATOR. THE DURATION OF THE PULSES WAS 20  
NSEC, AND DOSES RANGING FROM 0.8-14 MRAD WERE  
DELIVERED TO THE SAMPLES. WORKING WITH ORIENTED  
SAMPLES MAKES IT POSSIBLE TO DISTINGUISH AND IDENTIFY  
TWO DISTINCT SPECIES IN THE SAMPLES IRRADIATED IN  
AIR. THE RELATIVE CONCENTRATION OF THE TWO SPECIES  
VARIES AS A FUNCTION OF THE DOSE. IN SAMPLES  
RECEIVING LARGER DOSES OF RADIATION THE SPECIES -  
CF<sub>2</sub>-(CF-O-O)-CF<sub>2</sub>-DOMINATES THE ESR  
SPECTRUM. AT LOWER DOSES THE SPECIES -CF<sub>2</sub>-O-  
O. MAKES A LARGER RELATIVE CONTRIBUTION TO THE  
ESR SPECTRUM. SAMPLES WERE ALSO SUBJECTED TO  
IRRADIATION IN VACUUM. THE ESR SPECTRA OBTAINED  
FROM THE VACUUM-IRRADIATED SAMPLES BEFORE AND AFTER  
THE ADMISSION OF AIR IS DISCUSSED. SAMPLES WERE  
SUBJECTED (IN AIR) TO RADIATION FROM A 60CO  
SOURCE, RANGING FROM 5-30 MRAD, AT A DOSE RATE OF  
0.43 MRAD/H. THE SPECIES -CF<sub>2</sub>-O-O.  
DOMINATES THE ESR SPECTRUM OF 60CO IRRADIATED  
SAMPLES. THE DETAILS OF THE LINE SHAPES OF THE  
ESR SPECTRA OF SAMPLES IRRADIATED IN AIR ARE  
DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 698 432 7/5  
ALBERTA UNIV EDMONTON DEPT OF CHEMISTRY

RADIATION-INDUCED DIMERIZATION OF 1,3-CYCLOHEXADIENE. SOLVENT EFFECTS AND THE FORMATION OF THE DIELS-ALDER DIMERS BY A CATIONIC CHAIN MECHANISM, (U)

OCT 68 6P SCHUTTE, R. ; FREEMAN, G. R.

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN JNL. OF THE AMERICAN CHEMICAL SOCIETY, V91 N14 P3715-3720, 2 JUL 69. NO COPIES FURNISHED.

DESCRIPTORS: (\*RADIATION CHEMISTRY, \*POLYMERIZATION), (\*DIENES, RADIATION CHEMISTRIES), CYCLOALKENES, DIENE SYNTHESIS, ADDITION REACTIONS, MOLECULAR ISOMERISM, MOLECULAR ORBITALS (U)

IDENTIFIERS: CHAIN REACTIONS, CHEMICAL REACTION MECHANISMS, \*CYCLOHEXADIENE COMPOUNDS, \*RADIOLYSIS, TRIPLET ENERGY LEVELS (U)

THE RADIATION-INDUCED DIMERIZATION OF 1,3-CYCLOHEXADIENE OCCURRED BY TWO SIMULTANEOUS MECHANISMS: MECHANISM 1 PRODUCED MAINLY THE ENDO AND EXO DIELS-ALDER PRODUCTS OF 1,4,1',2' ADDITION; MECHANISM 2 PRODUCED MAINLY THE CIS-ANTI-CIS AND CIS-SYN-CIS ISOMERIC PRODUCTS OF 1,2,1',2' ADDITION. BOTH MECHANISMS WERE SENSITIZED BY THE APROTIC SOLVENTS BENZENE, N-HEXANE, CYCLOHEXANE, AND DI-N-PROPYL ETHER, AND WERE INHIBITED BY THE PROTIC SOLVENT ETHANOL. MECHANISM 1 INVOLVED A CATIONIC CHAIN REACTION IN BENZENE, AND PROBABLY ALSO IN THE OTHER APROTIC SOLVENTS. IN ALL THE APROTIC SOLVENTS THE YIELD OF THE DIELS-ALDER PRODUCTS WENT THROUGH A MAXIMUM AS THE 1,3-CYCLOHEXADIENE (CHD) CONCENTRATION WAS INCREASED. THERE WAS NO EVIDENCE OF A CHAIN IN MECHANISM 2 AND THE YIELDS OF THE CORRESPONDING DIMERS WERE RELATIVELY SMALL. IT APPEARS THAT TRIPLET-STATE CHD MOLECULES WERE THE IMMEDIATE PRECURSORS OF THE DIMERS FROM MECHANISM 2, AND THAT ROUGHLY HALF OF THE TRIPLET CHD MOLECULES RESULTED DIRECTLY OR INDIRECTLY FROM NEUTRALIZATION REACTIONS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 699 474            20/12        7/5        7/4  
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J INST FOR  
EXPLORATORY RESEARCH

Y(2+) AS A COLOR CENTER IN IRRADIATED CAF<sub>2</sub>.

(U)

AUG 68    15P        THEISSING, H. H. ; EWANIZKY,  
T. F. ; CAPLAN, P. J. ; GROSSE, D. W. ;

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN JNL. OF CHEMICAL PHYSICS,  
V40 N6 P2657-2671, 15 MAR 69.

DESCRIPTORS: (\*YTTRIUM, \*COLOR CENTERS), (\*CALCIUM  
FLUORIDES, COLOR CENTERS), (\*RADIATION CHEMISTRY, COLOR  
CENTERS), ULTRAVIOLET SPECTRA, VISIBLE SPECTRA, GAMMA  
RAYS, CRYSTAL DEFECTS, MOLECULAR ENERGY LEVELS        (U)  
IDENTIFIERS: JAHN-TELLER EFFECT, \*LIGAND FIELDS        (U)

THE ABSORPTION SPECTRUM OF BLUE, GAMMA-IRRADIATED  
CAF<sub>2</sub>:Y(3+) CRYSTALS SHOWS SEVERAL BANDS IN  
THE VISIBLE REGION WHOSE INTENSITY IS ROUGHLY  
PROPORTIONAL TO THE YTTRIUM CONCENTRATION.  
BLEACHING INTO THE INDIVIDUAL BANDS INDICATES THAT  
MORE THAN ONE CENTER IS RESPONSIBLE FOR THE WHOLE  
SPECTRUM. INCONSISTENT COLOR RESPONSE OF VARIOUS  
CRYSTAL SAMPLES TO GAMMA IRRADIATION SUGGESTS THAT  
ONLY THE CRYSTALS WITH SUFFICIENT Y(3+) IN CUBIC  
SITES, I.E., WITH THE CHARGE COMPENSATOR SOME  
DISTANCE AWAY, ARE COLORABLE. IN THIS CASE THE  
Y(2+) FORMED BY GAMMA IRRADIATION, AS WELL AS THE  
DEFECTS PRODUCED AT THE REMOTE CHARGE COMPENSATORS,  
BECOME COLOR CENTERS AND SHARE IN THE GENERATION OF  
THE SPECTRAL BANDS. THE QUESTION OF WHICH BAND  
(S) WOULD BE DUE TO Y(2+) IS EXAMINED BY  
FITTING THE BAND FREQUENCY TO THE ENERGY DIFFERENCE  
'E' - 'T' OF THE CUBIC FIELD-SPLIT D(1) LEVEL OF  
Y(2+) AND THE BANDWIDTH TO THE SPREAD OF THE 'T'  
LEVEL INTO ITS COMPONENTS DUE TO A DYNAMIC JAHN-  
TELLER EFFECT. THE BEST FIT TURNS OUT TO BE THE  
17 500/CM BAND WHICH YIELDS REASONABLE VALUES FOR  
CUBIC FIELD STRENGTH D(0), VIBRATIONAL  
DISPLACEMENT OF F(-) IONS, AND JAHN-TELLER  
ENERGY. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 699 623 7/5

ALBERTA UNIV EDMONTON DEPT OF CHEMISTRY

THE RADIOLYSIS OF LIQUID NITROUS OXIDE, (U)

OCT 67 3P ROBINSON, M. G. ; FREEMAN, G.  
R. ;

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF PHYSICAL  
CHEMISTRY, V72 N4 P1394-1396 APR 68. NO COPIES  
FURNISHED.

DESCRIPTORS: (\*NITROGEN OXIDES, \*RADIATION CHEMISTRY),  
LIQUEFIED GASES, CANADA (U)

IDENTIFIERS: CHEMICAL REACTION MECHANISMS, \*NITROGEN  
OXIDE (N2O), \*RADIOLYSIS (U)

DURING THE COURSE OF RECENT INVESTIGATIONS OF THE  
EFFECT OF NITROUS OXIDE ON THE RADIOLYSIS OF LIQUID  
HYDROCARBONS, AN ESTIMATE OF THE YIELD OF NITROGEN  
FROM THE 'DIRECT RADIOLYSIS' OF NITROUS OXIDE IN THE  
LIQUID PHASE WAS REQUIRED. ACCORDINGLY, THE  
RADIOLYSIS OF PURE LIQUID NITROUS OXIDE AND OF  
NITROUS OXIDE--CYCLOPENTANE SOLUTIONS WERE  
INVESTIGATED AND THE RESULTS ARE REPORTED.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 699 667 7/5  
ALBERTA UNIV EDMONTON DEPT OF CHEMISTRY

CHARGE SCAVENGING VS HYDROGEN ATOM SCAVENGING IN THE  
RADIOLYSIS OF LIQUID SATURATED HYDROCARBONS, (U)

SEP 67 7P ROBINSON, M. G. FREEMAN, G.  
K. ;

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF CHEMICAL  
PHYSICS, V46 N3 P983-989, 1 FEB 68. NO COPIES  
FURNISHED.

DESCRIPTORS: (\*HYDROCARBONS, \*RADIATION CHEMISTRY),  
PROPENES, NITROGEN OXIDES, CYCLOHEXANES, REACTION  
KINETICS, CARBON DIOXIDE, CANADA (U)  
IDENTIFIERS: NITROGEN OXIDE(N2O), \*RADIOLYSIS (U)

THE NITROGEN AND HYDROGEN YIELDS FROM THE GAMMA  
RADIOLYSIS OF SOLUTIONS OF NITROUS OXIDE IN VARIOUS  
SATURATED HYDROCARBONS WERE MEASURED. THE NITROGEN  
YIELDS WERE NEARLY THE SAME IN ALL HYDROCARBONS, BUT  
THE AMOUNTS OF DECREASE IN THE HYDROGEN YIELDS CAUSED  
BY THE NITROUS OXIDE VARIED MARKEDLY. THE RESULTS  
SUPPORT THE SUGGESTION THAT NITROUS OXIDE REACTS WITH  
ELECTRONS RATHER THAN HYDROGEN ATOMS IN LIQUID  
HYDROCARBONS, BUT INDICATE THAT SOME NITROGEN IS ALSO  
FORMED BY ANOTHER REACTION AND THAT ALL ELECTRONS DO  
NOT EVENTUALLY LEAD TO HYDROGEN FORMATION DURING THE  
RADIOLYSIS OF THE PURE HYDROCARBON. THE GASEOUS  
PRODUCT YIELDS FROM BINARY CYCLOHEXANE SOLUTIONS OF  
NITROUS OXIDE AND OF PROPYLENE WERE SUBJECTED TO  
KINETIC ANALYSIS ACCORDING TO SEVERAL MODELS. IT  
WAS CONCLUDED THAT THE DECREASE IN HYDROGEN YIELD  
CAUSED BY NITROUS OXIDE AND BY PROPYLENE CAN BE  
QUANTITATIVELY INTERPRETED IN TERMS OF INTERACTIONS  
BETWEEN THE SOLUTES AND THE CHARGED INTERMEDIATES.  
THIS OFFERS AN ALTERNATIVE TO THE HYDROGEN ATOM  
SCAVENGING MECHANISM THAT HAS USUALLY BEEN ASSUMED IN  
THE PAST FOR PROPYLENE. ALTHOUGH CARBON DIOXIDE  
AND PROPYLENE DO NOT ATTACH ELECTRONS IN THE GAS  
PHASE, THEY APPEAR TO DO SO IN LIQUID ALKANES.  
PROPYLENE IS A SOMEWHAT LESS EFFICIENT SCAVENGER  
THAN IS NITROUS OXIDE. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 699 668 7/5 7/4  
ALBERTA UNIV EDMONTON DEPT OF CHEMISTRY

THE RADIOLYSIS OF CYCLOHEXANE IN THE PRESENCE OF  
DEUTERATED OLEFINS. THE INVOLVEMENT OF THE OLEFINS  
IN HYDROGEN FORMATION, (U)

NOV 67 3P ROBINSON, M. G. ; FREEMAN, G.  
R. ;

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN JNL. OF PHYSICAL  
CHEMISTRY, V72 N5 P1780-1782 MAY 68. NO COPIES  
FURNISHED.

DESCRIPTORS: (\*CYCLOHEXANES, \*RADIATION CHEMISTRY),  
REACTION KINETICS, DEUTERIUM COMPOUNDS, ALKENES,  
HYDROGEN, DEUTERIUM, CANADA (U)  
IDENTIFIERS: HYDROGEN ABSTRACTION, \*RADIOLYSIS (U)

THE HYDROGEN YIELDS FROM THE RADIOLYSIS OF  
CYCLOHEXANE SOLUTIONS CONTAINING LOW CONCENTRATIONS  
OF DEUTERATED OLEFINS (C3-C7) HAVE BEEN  
MEASURED. THE PRESENCE OF SIGNIFICANT AMOUNTS OF  
HD AND D2 IN THE PRODUCTS CONFIRMS AN EARLIER  
SUGGESTION THAT THE OLEFINS PARTICIPATE IN HYDROGEN  
FORMATION AS WELL AS ACTING AS INHIBITORS.  
HOWEVER, IT IS MAINLY THE ALKYL GROUPS OF THE FULLY  
DEUTERATED OLEFINS THAT ARE INVOLVED IN HD  
FORMATION. A SMALL AMOUNT OF MOLECULAR D2  
ELIMINATION OCCURS FROM THE OLEFINIC CARBONS. THE  
ADDITION OF ETHANOL TO A SOLUTION OF C3D6 IN  
CYCLOHEXANE REDUCED THE YIELDS OF HD AND D2 BY  
THE SAME PROPORTIONATE AMOUNTS. THE RESULTS ARE  
EXPLAINED BY IONIC REACTIONS. THERE IS NO CLEAR-  
CUT EVIDENCE FOR THE OCCURRENCE OF HYDROGEN ATOM  
SCAVENGING. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 700 348 7/5  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D  
C

MECHANISM OF IONIZING-RADIATION ACTION ON  
SULFOCATIONS (O MEKHANIZME DEISTVIYA  
IONIZIRUYUSHCHEGO IZLUCHENIYA NA  
SULFOKATIONITY),

(U)

JAN 70 16P TULUPOV, P. E. ;BYCHKOV, N.  
V. ;KASPEROVICH, A. I. ;ROGINSKAYA, B. S. ;

REPT. NO. FSTC-HT-23-141-70  
PROJ: FSTC-0423100

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF MONO. SINTEZ I SOVYSTVA  
IONOOBMENNYKH MATERIALOV (SYNTHESIS AND PROPERTIES  
OF ION-EXCHANGE MATERIALS) MOSCOW, 1968 P125-133.

DESCRIPTORS: (\*ION EXCHANGE RESINS, \*RADIATION  
CHEMISTRY), (\*SULFITES, RADIATION CHEMISTRY), IONS,  
WATER, ION EXCHANGE, INFRARED SPECTRA, STYRENE PLASTICS,  
IONIZATION, USSR (U)  
IDENTIFIERS: TRANSLATIONS (U)

AN INVESTIGATION WAS MADE OF THE MECHANISM OF THE  
EXCHANGE CAPACITY REDUCTION IN SULFOPOLYSTYRENE  
CATION EXCHANGERS DURING IRRADIATION IN WATER.  
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 700 378 7/5 6/1  
CALGARY UNIV (ALBERTA) DEPT OF CHEMISTRY

THE COBALT-60 GAMMA-RADIOLYSIS OF REDUCED  
GLUTATHIONE IN DEAERATED AQUEOUS SOLUTIONS, (U)

JUN 68 7P LAL, MANOHAR ; ARMSTRONG, D.  
A. ; WIESER, META ;

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN RADIATION RESEARCH, V37 N2  
P246-252 FEB 69. NO COPIES FURNISHED.

DESCRIPTORS: (\*GLUTATHIONE, \*RADIATION CHEMISTRY),  
GLUTAMINE, PEPTIDES, SULFIDES, GAMMA RAYS, OXIDATION,  
CANADA (U)

IDENTIFIERS: CHEMICAL REACTION MECHANISMS,  
\*RADIOLYSIS, DISULFIDES (U)

THE MAJOR PRODUCTS OF RADIOLYSIS OF AIR-FREE  
AQUEOUS SOLUTIONS OF THE TRIPEPTIDE GLUTATHIONE ARE  
HYDROGEN, HYDROGEN SULFIDE, OXIDIZED GLUTATHIONE, AND  
GAMMA-GLUTAMYLALANYLGLYCINE. THE LAST OF THESE  
RESULTS FROM THE REPLACEMENT OF SH BY H. THERE  
IS NO EVIDENCE FOR SCISSION OF THE PEPTIDE CHAIN, AND  
THE PH DEPENDENCE AND MAGNITUDES OF THE PRODUCT  
YIELDS CLOSELY RESEMBLE THOSE OF THE ANALOGOUS  
PRODUCTS FROM CYSTEINE SOLUTIONS. THE RADIOLYTIC  
MECHANISM IS SHOWN TO BE SIMILAR TO THAT FOR  
CYSTEINE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 701 876 19/1 7/5  
PICATINNY ARSENAL DOVER N J

THE EFFECTS OF REACTOR IRRADIATION ON THE CHEMICAL  
CHARACTERISTICS OF SOLID EXPLOSIVES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
JAN 70 74P RIBAUDO, CHARLES ; MALLAY,  
JAMES ; MATSUGUMA, HAROLD J. ;  
REPT. NO. PA-TR-3893

UNCLASSIFIED REPORT

DESCRIPTORS: (\*EXPLOSIVES, \*RADIATION CHEMISTRY), TNT,  
HMX, PETN, INFRARED SPECTRA, X RAY DIFFRACTION,  
DIFFERENTIAL THERMAL ANALYSIS, NITROCELLULOSE, SOLID  
ROCKET PROPELLANTS (U)  
IDENTIFIERS: \*NITRO COMPOUNDS, DATB EXPLOSIVE (U)

A STUDY WAS MADE OF TNT, HMX/EXON (9505),  
DATB, AND PETN WHICH HAD BEEN IRRADIATED IN A  
NUCLEAR REACTOR TO DETERMINE CHEMICAL CHANGES INDUCED  
BY THE IRRADIATION. CHEMICAL CHANGES  
(STABILITY) WERE DETERMINED BY INFRARED  
SPECTROPHOTOMETRIC, X-RAY DIFFRACTION, AND  
DIFFERENTIAL THERMAL ANALYSIS OF THE POST-IRRADIATED  
EXPLOSIVES. IN ADDITION, A SIMILAR STUDY OF  
NITROCELLULOSE-BASE PROPELLANTS WAS CARRIED OUT.  
FROM THE DATA OBTAINED, THE ORDER OF DECREASING  
CHEMICAL STABILITY UNDER IRRADIATION WAS DATB,  
HMX/EXON, TNT, PETN, AND THE NITROCELLULOSE-  
BASE PROPELLANTS; DATB WAS FOUND TO BE THE MOST  
STABLE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 701 946 7/5 11/10  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D  
C

INVESTIGATION OF THE RADIOCHEMICAL SENSITIZATION  
EFFECT IN RUBBER (ISSLEDOVANIE EFFEKTA  
SENSIBILIZATSII RADIATIONNO KHLMICHESKIKH  
PROTSESSOV V KAUCHUKAKH), (U)

NOV 69 19P KOZLOV, V. T. ; KAPLUNOV, M.  
YA. ; TARASOVA, Z. N. ; DOGADKIN, B. A. ;  
REPT. NO. FSTC-HT-23-139-70  
PROJ: FSTC-0423100

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF VYSOKOMOLEKULYARNYE  
SOEDINENIYA. SERIYA A (USSR) V10 N5 P987-994  
1968.

DESCRIPTORS: (\*RADIATION CHEMISTRY,  
\*CROSSLINKING(CHEMISTRY)), (\*RUBBER, RADIATION  
CHEMISTRY), (\*SYNTHETIC RUBBER, RADIATION CHEMISTRY),  
(\*HALOGENATED HYDROCARBONS, RADIATION CHEMISTRY),  
ELECTRON IRRADIATION, CHLORINE COMPOUNDS, FREE RADICALS,  
USSR (U)  
IDENTIFIERS: \*CHLORINE ORGANIC COMPOUNDS, \*RADIOLYSIS,  
\*FREE RADICAL SCAVENGERS, STYRENE BUTADIENE RESINS,  
TRANSLATIONS (U)

CERTAIN CHARACTERISTIC EFFECTS OF A NUMBER OF  
HALOGEN CONTAINING COMPOUNDS, USED EARLIER AS RADIO-  
CHEMICAL STRUCTURING SENSITIZERS FOR RUBBERS OF  
DIFFERENT STRUCTURE WERE INVESTIGATED. AS A RESULT  
OF THE INVESTIGATION, THE FOLLOWING CONCLUSIONS WERE  
DRAWN: (1) DURING RADIOLYSIS THE SENSITIZATION  
EFFECT IN A NUMBER OF HALOGEN CONTAINING ORGANIC  
SUBSTANCES INCREASES FROM COMPLEX AROMATIC STRUCTURES  
WITH A LARGE NUMBER OF ATOMS TO LINEAR STRUCTURES  
WITHOUT DOUBLE BONDS AND WITH A SMALL NUMBER OF  
ATOMS; (2) IN THE GENERAL CASE OF THE  
SENSITIZATION EFFECT IS DISPLAYED BY COMPOUNDS  
CONTAINING ATOMS WITH HIGH ELECTRONAFFINITY AND  
POSSESSING THE ABILITY TO ACCEPT THERMALIZED  
ELECTRONS; (3) DURING THE RADIOLYSIS OF  
APPROPRIATE SENSITIZERS ONE OF THE MOST IMPORTANT  
PROCESSES IS THE SPLITTING OF HALOGEN, WHERE A  
SIGNIFICANT CONTRIBUTION IS MADE BY THE DISSOCIATIVE  
ELECTRON CAPTURE REACTION;

(U)

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UNCLASSIFIED

ZOM07

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 701 958 7/5  
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

SECONDARY PROCESSES IN GAS PHASE RADIOLYSIS OF  
HYDROCARBONS, (U)

AUG 60 3P FUTRELL, JEAN H. ;  
REPT. NO. ARL-116

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN JNL. OF PHYSICAL  
CHEMISTRY, V65 P565-566 1961.

DESCRIPTORS: (\*HYDROCARBONS, \*RADIATION CHEMISTRY),  
VAPORS (U)  
IDENTIFIERS: \*RADIOLYSIS (U)

IRRADIATION STUDIES OF HYDROCARBON VAPORS MUST BE  
CONDUCTED AT VERY LOW CONVERSION IF MEANINGFUL  
RESULTS ARE TO BE OBTAINED. OTHER AUTHORS HAVE  
DEMONSTRATED THAT UNSATURATED PRODUCTS FORMED WITH  
VERY HIGH YIELD INITIALLY IN ALPHA-PARTICLE AND  
GAMMA-RADIOLYSIS ACT AS INTERNAL SCAVENGERS; THUS A  
VERY LOW STEADY-STATE CONCENTRATION OF UNSATURATES IS  
MEASURED AT CONVERSIONS OF A FEW PER CENT. THIS IS  
VERY REASONABLY ATTRIBUTED TO HYDROGEN ATOM  
SCAVENGING BY THE UNSATURATED PRODUCTS. SUCH  
BEHAVIOR, HOWEVER, IS DISTINCTLY DIFFERENT FROM THAT  
OBSERVED IN AN EARLIER STUDY OF NORMAL HEXANE WITH 2  
MEV. ELECTRONS FROM A VAN DE GRAAFF  
ACCELERATOR. SEVERAL EXPLORATORY EXPERIMENTS WERE  
PERFORMED IN AN ATTEMPT TO RESOLVE THIS DISCREPANCY  
AND THE RESULTS ARE REPORTED IN THIS COMMUNICATION.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 20M07

AD- 702 598 7/5  
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

GAS PHASE RADIOLYSIS OF N-PENTANE, (U)

APR 60 4P FUTRELL, JEAN H. ;  
REPT. NO. ARL-TN-60-183

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN JNL. OF PHYSICAL  
CHEMISTRY, V04 P1634-1636 1960.

DESCRIPTORS: (\*ALKANES, \*RADIATION CHEMISTRY), VAPORS,  
GAMMA RAYS, IONIZATION, FREE RADICALS (U)  
IDENTIFIERS: \*PENTANES, \*RADIOLYSIS (U)

PYREX AMPOULES OF N-PENTANE VAPOR WERE EXPOSED TO  
COBALT-60 GAMMA-RAYS AND HUNDRED ELECTRON VOLT YIELDS  
OF THE LOWER MOLECULAR WEIGHT PRODUCTS WERE  
DETERMINED. IN DECREASING ORDER OF IMPORTANCE THESE  
INCLUDED HYDROGEN, PROPANE, ETHYLENE, ETHANE,  
METHANE, PROPYLENE, ACETYLENE AND BUTANE. THE  
MAGNITUDE OF THE YIELDS AND THE PRODUCT DISTRIBUTION  
ARE CONSISTENT WITH THE ASSUMPTION THAT THE REACTION  
SEQUENCE IS IONIZATION OF THE MOLECULE,  
FRAGMENTATION, REACTION OF THE FRAGMENT IONS WITH  
PENTANE MOLECULES, AND NEUTRALIZATION OF THE PRODUCT  
IONS, FOLLOWED BY INTERCOMBINATION OF FREE RADICALS  
FROM THESE PROCESSES. CERTAIN IMPLICATIONS OF THIS  
MECHANISM ARE SUGGESTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 702 603 7/5  
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

EXAMINATION OF GAMMA-IRRADIATED BENZENE FOR  
OPTICAL ACTIVITY,

(U)

60 4P SPIALTER, LEONARD ; FUTRELL,  
JEAN H. ;  
REPT. NO. ARL-TN-60-188

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN NATURE, V188 N4746 P225-226,  
15 OCT 60.

DESCRIPTORS: (\*BENZENE, \*RADIATION CHEMISTRY),  
(\*MOLECULAR ROTATION, BENZENE), GAMMA RAYS

(U)

THE GAMMA-IRRADIATION OF PURIFIED BENZENE WAS  
UNDERTAKEN TO DETERMINE IF PREVIOUS RUSSIAN  
RESEARCH WHICH CLAIMED AN OPTICALLY ACTIVE COMPOUND  
WAS FORMED UPON BENZENE IRRADIATION WAS TRUE. THE  
AUTHORS FOUND NO EVIDENCE OF THE FORMATION OF AN  
OPTICALLY ACTIVE COMPOUND.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 702 924 7/5  
PICATINNY ARSENAL DOVER N J

RADIATION-INDUCED NITRATION OF BENZENE WITH  
DINITROGEN TETROXIDE. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
MAR 70 36P SMETANA, ANDREW F. ;  
CASTORINA, THOMAS C. ;  
REPT. NO. PA-TR-3915

UNCLASSIFIED REPORT

DESCRIPTORS: (\*NITROBENZENES, SYNTHESIS(CHEMISTRY)),  
(\*BENZENE, \*NITRATION), (\*RADIATION CHEMISTRY,  
NITRATION), NITROGEN OXIDES, FREE RADICALS (U)  
IDENTIFIERS: \*NITRO COMPOUNDS, NITROGEN OXIDE(NO2),  
\*BENZENE/DINITRO, CHEMICAL REACTION MECHANISMS (U)

THE GAMMA-RADIATION-INDUCED NITRATION OF BENZENE  
WITH DINITROGEN TETROXIDE (N2O4) IN THE LIQUID  
PHASE AT 20C YIELDED NITROBENZENE (NB) AS THE  
MAJOR PRODUCT AND THE ISOMERIDES OF DINITROBENZENE  
(DNB) AS THE MINOR PRODUCTS OF RADIOLYSIS. THE  
YIELD G(NB) INCREASED WITH INCREASING CONCENTRATION  
OF N2O4 FROM 0.14 FOR 6 MOLE % N2O4 TO 1.18  
FOR 95 MOLE % N2O4 IN BENZENE. THE RATIO OF  
O- TO P-DNB IS THE INVERSE OF THAT OBTAINED FROM  
CONVENTIONAL MIXED ACID NITRATION AND IS CONSIDERED  
TYPICAL OF RADIOLYSIS. THE NITRO-SUBSTITUTION  
PRODUCT FORMATIONS ARE SHOWN TO BE FROM PRIMARY  
PROCESSES OF RADIOLYSIS AND ARE PROPOSED AS BEING  
DERIVED FROM AN INTERMEDIATE SPECIE INVOLVING AN  
NO2.C6H5H(+) PI-DONOR COMPLEX. THE NO2 IN  
EQUILIBRIUM WITH THE N2O4 IN THE LIQUID PHASE IS  
REGARDED AS THE NITRATING AGENT IN THE FORM OF A  
RADICAL AS WELL AS A NITRONIUM ION (NO2(+)).  
BOTH WATER AND NITROUS ACID AS SECONDARY PRODUCTS  
OF RADIOLYSIS ARE SUGGESTED AS ANTI-CATALYSTS  
INHIBITING THE DEGREE OF THE RADIATION-INDUCED  
NITRATION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 703 024 7/4  
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

DEVELOPMENT OF PHYSICAL CHEMISTRY (SELECTED  
ARTICLES),

(U)

FEB 70 230P EMANUEL, N. M. ; KOLESOV, V.  
P. ; BUGAENKO, L. T. ; SARAIEVA, V. V. ; TSETLIN,  
B. L. ;  
REPT. NO. FTU-MT-24-332-69  
PROJ: FTU-60107

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED MACHINE TRANS. OF MONO.  
RAZVITIE FIZICHESKOI KHIMII, N.P., 1967 P14-82, 311-  
383, BY EDWIN P. PENTECOST.

DESCRIPTORS: (\*RADIATION CHEMISTRY, REVIEWS),  
(\*THERMOCHEMISTRY, REVIEWS), (\*REACTION KINETICS,  
REVIEWS), BIBLIOGRAPHIES, HISTORY, USSR  
IDENTIFIERS: TRANSLATIONS

(U)

(U)

REVIEWS ARE PRESENTED ON THE HISTORICAL BACKGROUND  
OF THREE AREAS OF PHYSICAL CHEMISTRY: CHEMICAL  
KINETICS (418 REFERENCES); THERMOCHEMISTRY  
(217 REFERENCES); AND RADIATION CHEMISTRY  
(271 REFERENCES).

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 705 691 11/12 7/5  
SVENSKA TRAFORSKNINGSINSTITUTET STOCKHOLM

THE EFFECT OF GAMMA-RADIATION ON SOME PAPER  
PROPERTIES,

(U)

OCT 68 7P KUBAT, JOSEF ; MARTIN-LOF,  
SVERKER ; DE RUVO, ALF ;  
REPT. NO. MEDDELANDE-549

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN SVENSK PAPPERSTIDNING, V71  
N23 P651-850 1968. NO COPIES FURNISHED.  
SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH SWEDISH  
FOREST PRODUCTS RESEARCH LAB., STOCKHOLM.

DESCRIPTORS: (\*PAPER, \*RADIATION CHEMISTRY),  
(\*CELLULOSE, RADIATION CHEMISTRY), WOOD PULP, GAMMA  
RAYS, HYDRAZINE, MECHANICAL PROPERTIES, SWEDEN (U)  
IDENTIFIERS: PAPERMAKING, RADIOLYSIS, \*SULFATE  
PULPING (U)

THE EFFECT OF GAMMA-RADIATION (60CO) ON  
CERTAIN PROPERTIES OF SHEETS MADE FROM BLEACHED AND  
UNBLEACHED SULPHATE PULP HAS BEEN STUDIED.  
PROPERTIES EXAMINED INCLUDED TENSILE AND ELONGATION  
BEHAVIOUR, BURST AND TEAR FACTORS, BRIGHTNESS AND  
WATER ABSORPTION (COBB). AS FAR AS THE  
MECHANICAL PROPERTIES AND THE BRIGHTNESS WERE  
CONCERNED NO CHANGES WERE NOTED WITH DOSES UP TO CA.  
10 TO THE 6TH RAD. FURTHER IRRADIATION LED TO A  
MARKED DETERIORATION BOTH IN STRENGTH AND IN  
BRIGHTNESS. IN THE PRESENCE OF HYDRAZINE, A RADICAL  
SCAVENGER, THE CRITICAL RADIATION DOSE COULD BE  
INCREASED. FOR ROSIN SIZED PAPER A MINIMUM IN THE  
COBB WATER ABSORPTION VALUE WAS OBSERVED AT CA 10,  
000 RAD. IN CONTRAST TO THE MECHANICAL AND OTHER  
PROPERTIES THE DP DECREASED WITH INCREASING  
RADIATION DOSE OVER THE WHOLE OF THE RANGE STUDIED.  
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 709 817 7/5  
CALIFORNIA INST OF TECH PASADENA DEPT OF CHEMISTRY

RADIATION-INDUCED REACTIONS OF 1,3-  
CYCLOHEXADIENE, (U)

SEP 69 8P PENNER, THOMAS L. ; WHITTEN,  
DAVID G. ; HAMMOND, GEORGE S. ;  
CONTRACT: AF 49(638)-1479  
PROJ: AF-9538  
MONITOR: AFOSK 70-2036TR

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF AMERICAN CHEMICAL  
SOCIETY, V92 N9 P2861-2867, 6 MAY 70.

DESCRIPTORS: (\*CYCLOHEXENES, \*RADIATION CHEMISTRY),  
DIENES, GAMMA RAYS, MOLECULAR ORBITALS (U)  
IDENTIFIERS: \*CYCLOHEXADIENE COMPOUNDS,  
\*DIMERIZATION (U)

IRRADIATION OF 1,3-CYCLOHEXADIENE WITH GAMMA RAYS  
LEADS TO DIMERIZATION EITHER IN SOLUTION OR IN THE  
NEAT LIQUID. RELATIVE AMOUNTS OF THE PRODUCTS VARY  
WIDELY WITH REACTION CONDITIONS BUT THE COMPOSITION  
OF THE MIXTURES CAN BE EXPRESSED AS CONSISTING OF  
VARIABLE AMOUNTS OF TWO GROUPS. ONE SET OF PRODUCTS  
CORRESPONDS TO THOSE FORMED IN THERMAL DIMERIZATION  
AND THE OTHER HAS THE DISTRIBUTION FOUND IN  
PHOTODIMERIZATION MEDIATED BY TRIPLET SENSITIZERS.  
FORMATION OF THE 'THERMAL' DIMERS IS INHIBITED BY  
ISOPROPYL ALCOHOL, A CATION SCAVENGER, AND PROMOTED  
BY ELECTRON SCAVENGERS SO A CATIONIC MECHANISM IS  
POSTULATED. RING CLEAVAGE TO GIVE 1,3,5-HEXATRIENE  
IS ALSO OBSERVED AND ATTRIBUTED TO AN EXCITED SINGLET  
STATE OF THE DIENE. SINCE RING OPENING IS NOT  
AFFECTED BY ELECTRON PROCESSES AND THAT TRIPLETS ARE  
PRODUCED BY CHARGE NEUTRALIZATION. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 710 231 7/5  
BALLISTIC RESEARCH LABS ABERDEEN PROVING GROUND MD

ELECTRON SPIN RESONANCE STUDIES ON GAMMA-IRRADIATED KMNO<sub>4</sub>, (U)

MAY 70 63P WHITE, KEVIN J. ;  
REPT. NO. BRL-1482  
PROJ: RDT/E-1-T-061102-B-13-A

UNCLASSIFIED REPORT

DESCRIPTORS: (\*PERMANGANATES, \*ELECTRON PARAMAGNETIC RESONANCE), (\*RADIATION CHEMISTRY, PERMANGANATES), POTASSIUM COMPOUNDS, FREE RADICALS, GAMMA RAYS, HYPERFINE STRUCTURE (U)  
IDENTIFIERS: \*POTASSIUM PERMANGANATE (U)

ELECTRON SPIN RESONANCE (ESR) STUDIES WERE CARRIED OUT ON THE RADICALS PRODUCED BY THE GAMMA-IRRADIATION OF SINGLE CRYSTALS OF KMNO<sub>4</sub>. A CRYSTAL HOLDER HAS BEEN DESIGNED WHICH ALLOWS AN ACCURATE ORIENTATION OF THE CRYSTAL. ANALYSIS OF THE DATA YIELDS AT LEAST TWO PARAMAGNETIC SPECIES. THE FIRST RADICAL IS PRODUCED BY ROOM TEMPERATURE IRRADIATION AND GIVES A SINGLE LINE FOR EACH OF TWO INEQUIVALENT MAGNETIC SITES. THERE IS NO RESOLVABLE HYPERFINE STRUCTURE. THE SPECTRUM IS TENTATIVELY ASSIGNED TO THE MNO<sub>2</sub> OR THE MNO<sub>4</sub> RADICAL. THE SECOND RADICAL IS PRODUCED BY IRRADIATION AT 77K AND THE SPECTRUM DISAPPEARS IRREVERSIBLY AT SLIGHTLY HIGHER TEMPERATURES. THIS SPECTRUM IS ASSIGNED TO THE MNO<sub>4</sub>(-2) RADICAL. THE RELATIONSHIP OF THE RADICALS OBSERVED TO THE EFFECT OF HIGH ENERGY RADIATION ON THE DECOMPOSITION OF KMNO<sub>4</sub> IN THE LIGHT OF CURRENT SOLID STATE THEORY IS DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 710 467 7/5 6/18  
AUCKLAND UNIV (NEW ZEALAND) DEPT OF CHEMISTRY

COBALT-60-GAMMA RADIOLYSIS OF OXYGENATED AQUEOUS  
SOLUTIONS OF CYSTEINE AT PH7, (U)

AUG 69 7P PACKER, J. E. ; WINCHESTER,  
R. V. ;  
CONTRACT: AF-AFOSR-950-65  
PROJ: AF-9760  
MONITOR: AFOSR 7U-2216TR

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN CANADIAN JNL. OF  
CHEMISTRY, V48 N3 P417-421 1970.

DESCRIPTORS: (\*THIOLS, \*RADIATION CHEMISTRY), (\*AMINO  
ACIDS, RADIATION CHEMISTRY), OXYGEN, GAMMA RAYS,  
SOLUTIONS (MIXTURES), ORGANIC SULFUR COMPOUNDS, FREE  
RADICALS, NEW ZEALAND (U)  
IDENTIFIERS: \*RADIOLYSIS, \*CYSTEINE, \*DISULFIDES (U)

IN THE RADIOLYSIS OF OXYGENATED AQUEOUS SOLUTIONS  
OF CYSTEINE (RSH) AT PH7, SHORT CHAIN REACTIONS  
OCCUR YIELDING CYSTEINE (RSSR) AND HYDROGEN  
PEROXIDE. TWO COMPETING REACTION PATHS INVOLVING  
REACTION OF THE THIYL RADICAL (RS.) WITH OXYGEN  
OR THIOL ANION (RS-) ARE POSTULATED TO EXPLAIN  
THE RESULTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 710 707 7/5  
DEFENCE STANDARDS LABS ALEXANDRIA (AUSTRALIA)

ELECTRON CAPTURING BY NITROUS OXIDE IN GAMMA-IRRADIATED POLYPROPYLENE,

(U)

JAN 70 4P PINKERTON, D. M. ;

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN AUSTRALIAN JNL. OF CHEMISTRY, V23 P1039-1042 1970. NO COPIES FURNISHED.

DESCRIPTORS: (\*POLYETHYLENE PLASTICS, \*RADIATION CHEMISTRY), (\*NITROGEN OXIDES, \*ELECTRON CAPTURE), ELECTRONS, GAMMA RAYS, AUSTRALIA

(U)

IDENTIFIERS: NITROGEN OXIDE(N2O), \*POLYPROPYLENE, \*ELECTRON TRAPS

(U)

AS PART OF AN INVESTIGATION OF THE DETERIORATION OF ORGANIC MATERIALS, THE AUTHORS HAVE BEEN STUDYING THE EFFECTS OF HIGH ENERGY RADIATION ON SOME POLYOLEFINS. THE COMMUNICATION REPORTS CHEMICAL EVIDENCE FOR SCAVENGEABLE ELECTRONS IN IRRADIATED POLYPROPYLENE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 711 200 7/5 6/18 6/1  
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV  
OF BIOLOGY

X- AND GAMMA-RADIOLYSIS OF SOME TRYPTOPHAN  
DIPEPTIDES, (U)

MAR 70 8P WINCHESTER, R. V. ; LYNN, K.  
R. ;  
MONITOR: NRC 11399

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN INTERNATIONAL JNL. OF  
RADIATION BIOLOGY, V17 N6 P541-548 1970. NO COPIES  
FURNISHED.  
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 26 FEB  
70.

DESCRIPTORS: (\*PEPTIDES, \*RADIATION CHEMISTRY),  
(\*TRYPTOPHAN, PEPTIDES), X RAYS, GAMMA RAYS, FREE  
RADICALS, CANADA (U)

IRRADIATION OF THE DIPEPTIDES TRYPTOPHYL-GLYCINE, -  
ALANINE, -LEUCINE, -TRYPTOPHAN, -TYROSINE, AND -  
PHENYLALANINE IN AERATED SOLUTION GAVE ESSENTIALLY  
THE SAME PRODUCTS IN EACH CASE. THE MAJOR PRODUCTS  
ARE THOSE KNOWN TO ARISE FROM THE RADIOLYSIS OF  
TRYPTOPHAN, WHICH IS THEREFORE PROPOSED AS THE  
INITIAL PRODUCT OF HYDROXYL RADICAL ATTACK ON THE  
ALPHA-CARBON ATOM ADJACENT TO THE PEPTIDE NITROGEN.  
THE PRESENCE OF AN AROMATIC RING IN THE C-  
TERMINAL ACID (TRY-TYR, TRY-PHE) RESULTS ALSO IN  
HYDROXYL RADICAL ATTACK ON THIS RING.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 712 321 7/5  
BALLISTIC RESEARCH LABS ABERDEEN PROVING GROUND MD  
EFFECTS OF HIGH ENERGY ELECTRON IRRADIATION ON  
SINGLE CRYSTALS OF AMMONIUM AND SODIUM BIFLUORIDE,

(U)

AUG 70 36P VANDE KIEFT, LAWRENCE J. ;  
REPT. NO. BRL-1490  
PROJ: RDT/E-1-T-061101-A-91-A

UNCLASSIFIED REPORT

DESCRIPTORS: (\*FLUORIDES, \*RADIATION CHEMISTRY),  
(\*ELECTRON PARAMAGNETIC RESONANCE, FLUORIDES), DAMAGE,  
RADIATION EFFECTS, ELECTRON IRRADIATION, IONS, AMMONIUM  
COMPOUNDS, MOLECULAR ASSOCIATION, SODIUM COMPOUNDS (U)  
IDENTIFIERS: HYDROGEN BONDING (U)

RADIATION EFFECTS IN SINGLE CRYSTALS OF AMMONIUM BIFLUORIDE AND SODIUM BIFLUORIDE WERE STUDIED BY ELECTRON SPIN RESONANCE AND OPTICAL METHODS FOLLOWING 1-MEV ELECTRON IRRADIATIONS AT 77K. THE IRRADIATIONS CHANGED THE SAMPLES FROM CLEAR TO DEEP BLUE-GREEN AND BOTH CRYSTAL TYPES SHOWED PARAMAGNETIC RESONANCES WHICH WERE DETERMINED TO RESULT FROM F<sub>2</sub>(-) IONS IN ANION SITES. THIS DEFECT RESULTED FROM THE DISPLACEMENT OF HYDROGEN ATOMS FROM THEIR NORMAL POSITIONS IN THE LINEAR BIFLUORIDE (HF<sub>2</sub>) (-) IONS. ONLY IN NH<sub>4</sub>HF<sub>2</sub> WERE THE DISPLACED HYDROGEN ATOMS DETECTED. BEST-FIT SPIN-HAMILTONIAN PARAMETERS FOR THE F<sub>2</sub>(-) AND H DEFECTS ARE GIVEN. OPTICAL ABSORPTION MEASUREMENTS ON THE IRRADIATED BIFLUORIDES ARE DISCUSSED. THE ESR ANNEALING CHARACTERISTICS FOR THE F<sub>2</sub>(-) IONS IN BOTH CRYSTALS APPEAR TO FOLLOW SECOND-ORDER KINETICS. IN TWO OF THE THREE INEQUIVALENT SITES FOR F<sub>2</sub>(-) IONS IN NH<sub>4</sub>HF<sub>2</sub> THE ORIENTATION OF THE F<sub>2</sub>(-) MOLECULAR AXIS DIFFERS BY EIGHT DEGREES FROM THE REPORTED CRYSTALLOGRAPHIC AXIS OF THE CORRESPONDING BIFLUORIDE ANION. THIS IS INTERPRETED TO RESULT FROM WEAKER HYDROGEN BONDING BETWEEN NITROGEN AND FLUORINE FOR THE F<sub>2</sub>(-) ION THAN FOR THE BIFLUORIDE ION IN AMMONIUM BIFLUORIDE, BECAUSE OF AN INCREASED N-H-F DISTANCE FOR THE SHORTER F<sub>2</sub>(-) IONS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 20M07

AD- 713 551 7/5  
BALLISTIC RESEARCH LABS ABERDEEN PROVING GROUND MD

THE EFFECT OF STRUCTURE ON RADIATION CHEMICAL  
REACTIVITY, (U)

69 11P KLEIN, NATHAN ;

UNCLASSIFIED REPORT

DESCRIPTORS: (\*WATER, \*IONIZATION), (\*RADIATION  
CHEMISTRY, WATER), (\*EXCITONS, WATER), ELECTRON  
IRRADIATION, DECOMPOSITION, ELECTROLYTES (U)  
IDENTIFIERS: HOLES (ELECTRON DEFICIENCIES) (U)

SEVERAL ASPECTS OF THE RADIATION CHEMISTRY OF WATER  
ARE DISCUSSED. IT IS PROPOSED THAT THE VERY FAST  
REACTION OF  $E(-)(AQ)$  IS:  $E(-)(AQ) +$   
 $H_2O(+)$  YIELDS  $H_2O^*$ . THE PRODUCT OF THE  
REACTION,  $H_2O^*$ , IS AN ELECTRON-HOLE PAIR, OR  
EXCITON. THE VERY LARGE SIZE AND HIGH MOBILITY OF  
THE WATER CLUSTER MAKES AN ENCOUNTER RADIUS OF 25A  
FOR THE REACTION REASONABLE. THE EXISTENCE, IN  
AQUEOUS SOLUTION, OF BOTH HOLES AND EXCITONS HAS BEEN  
PROPOSED ALTHOUGH EXPERIMENTAL EVIDENCE TO DATE IS  
STILL SO SPARSE AS TO BE HIGHLY CONJECTURAL.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 715 391 7/5 19/1  
PICATINNY ARSENAL DOVER N J

ION-PAIR YIELDS AND KINETIC BEHAVIOR OF  
FREE CHARGES IN NONPOLAR LIQUIDS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
NOV 70 34P CAPELLOS,CHRISTOS ;  
REPT. NO. PA-TR-4054  
PROJ: DA-1-T-061102-A-32-B  
TASK: 1-T-061102-A-32-B-01

UNCLASSIFIED REPORT

DESCRIPTORS: (\*EXPLOSIVES, \*RADIATION CHEMISTRY),  
EXPLOSIONS, IONS, SOLUTIONS(MIXTURES), ELECTROSTATIC  
FIELDS, REACTION KINETICS, FREE RADICALS, ELECTRON  
IRRADIATION (U)  
IDENTIFIERS: \*CARBONIUM IONS, PENTANE/2-2-4-TRIMETHYL,  
\*RADIOLYSIS (U)

YIELDS OF PH<sub>3</sub>C(+) WERE DETERMINED BY  
MICROSECOND AND NANOSECOND PULSE RADIOLYSIS OF  
TRIPHENYLMETHYLCHLORIDE SOLUTIONS IN FIVE SOLVENTS  
(N-HEXANE, CYCLOHEXANE, 2,2,4-TRIMETHYLPENTANE,  
CARBON TETRACHLORIDE, AND CARBON DISULFIDE).  
THESE YIELDS ARE IN EXCELLENT AGREEMENT WITH THE  
ION-PAIR YIELDS DETERMINED FOR THE SAME SOLVENTS BY  
CONDUCTIVITY METHODS. IN ADDITION, THE  
TRIPHENYLMETHYLCHLORIDE METHOD ALLOWS MEASUREMENTS OF  
RATE CONSTANTS FOR PROTON-TRANSFER AND ION-  
RECOMBINATION REACTIONS, AS WELL AS THE STUDY OF THE  
REACTIVITY OF MODEL COMPOUNDS OF EXPLOSIVES, OR  
EXPLOSIVES THEMSELVES, TOWARDS THE POSITIVE CHARGE.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 717 243 7/5

BALLISTIC RESEARCH LABS ABERDEEN PROVING GROUND MD

PULSE RADIOLYSIS TECHNIQUES,

(U)

NOV 70 45P KLEIN, NATHAN ; ROCK, THEODORE

J. ;

REPT. NO. BRL-1508

PROJ: FTD/E-1-B-062104-A-8903

UNCLASSIFIED REPORT

DESCRIPTORS: (\*RADIATION CHEMISTRY, LABORATORY  
EQUIPMENT), TEST METHODS, PHOTOMULTIPLIER TUBES, LASERS,  
IONIZATION, ULTRAVIOLET SPECTRA, VISIBLE SPECTRA,  
SPECTROSCOPY, ELECTROMAGNETIC PULSES, REACTION  
KINETICS (U)

IDENTIFIERS: \*RADIOLYSIS (U)

THE REPORT DEALS WITH THE DEVELOPMENT OF ADVANCED  
PULSE RADIOLYSIS TECHNIQUES. DESIGN PARAMETERS FOR  
LIGHT SOURCES, DETECTORS AND DATA RECORDING SYSTEMS  
ARE DISCUSSED AND AN ANALYTICAL ARRAY IS DESCRIBED  
THAT MAKES POSSIBLE THE ACQUISITION OF SPECTRAL DATA  
WITH HIGH SENSITIVITY AND NANOSECOND RESOLVING TIME.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 718 433 7/5 20/12  
KANSAS UNIV LAWRENCE DEPT OF GEOLOGY

RADIATION DAMAGE AND CHEMICAL REACTIONS  
INDUCED IN CRYSTALLINE SOLIDS BY HIGH-  
ENERGY PROTON BOMBARDMENT. (U)

DESCRIPTIVE NOTE: FINAL REPT.. 1 JUL 68-1 JUL 70,  
SEP 70 55P ZELLER, EDWARD J. ;  
DRESCHHOFF, GISELA ; VIRMANI, YASH P. ; ZIMBRICK,  
JOHN ;

CONTRACT: F19628-69-C-0009  
PROJ: AF-8602  
TASK: 860202  
MONITOR: AFCL 70-0594

UNCLASSIFIED REPORT

DESCRIPTORS: (\*DIAMONDS, \*ION BOMBARDMENT), (\*ELECTRON  
PARAMAGNETIC RESONANCE, DIAMONDS), (\*CALCIUM COMPOUNDS,  
\*RADIATION CHEMISTRY), (\*ALKALI METAL COMPOUNDS,  
ELECTRON PARAMAGNETIC RESONANCE), FREE RADICALS,  
RADIATION CHEMISTRY, PROTON BOMBARDMENT, DEUTERON  
BOMBARDMENT, GAMMA RAYS, PARAMAGNETIC RESONANCE,  
HYDROGEN, CRYSTAL DEFECTS, HALIDES, PHOSPHATES (U)  
IDENTIFIERS: \*ALKALI HALIDES, \*CALCIUM PHOSPHATES,  
\*ELECTRON PARAMAGNETIC RESONANCE (U)

THE PRIMARY OBJECTIVE OF THE RESEARCH WAS TO  
DETERMINE THE EXTENT AND NATURE OF CHEMICAL CHANGES  
PRODUCED IN SOLID TARGETS BY FAST HEAVY PARTICLE  
IRRADIATION. THE MAJOR PORTION OF THE WORK INVOLVED  
PROTON IRRADIATION OF SOLIDS USING ENERGY RANGES FROM  
0.7 TO 2.5 MEV. ALPHA PARTICLES AND DEUTERONS  
WERE ALSO AVAILABLE AND WERE USED FOR SPECIAL  
STUDIES. IN GENERAL, THE RESULTS OF THE  
BOMBARDMENTS WERE EVALUATED WITH EITHER ELECTRON SPIN  
RESONANCE (ESR) OR DIFFERENTIAL THERMAL ANALYSIS  
(DTA) TECHNIQUES. THE DATA PROVIDED BY THE ESR  
ANALYTICAL METHODS TENDS TO SUBSTANTIATE THE  
CONCLUSION THAT PROTON BOMBARDMENT OF DIAMOND RESULTS  
IN THE FORMATION OF CH RADICALS. FURTHERMORE,  
THERE IS NO DOUBT THAT H ATOMS CAN BE TRAPPED IN  
THE DIAMOND LATTICE AND WILL REMAIN UNCOMBINED AT  
LIQUID NITROGEN TEMPERATURE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 718 796 7/5  
DUKE UNIV DURHAM N C DEPT OF PHYSICS

SOLID STATE STUDIES WITH MICROWAVES. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 OCT 63-30 SEP 70,  
JAN 71 10P GORDY, WALTER ;  
CONTRACT: DA-ARO-D-31-124-70-G26, DA-ARO(D)-31-  
124-G1053  
PROJ: AROD-4131-P  
MONITOR: AROD 4131:35-P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: CONTINUATION OF GRANTS DA-  
ARO(D)-31-124-G-428 AND DA-ARO(D)-31-124-G-731.

DESCRIPTORS: (\*ELECTRON PARAMAGNETIC RESONANCE,  
\*RADIATION CHEMISTRY), (\*MICROWAVE SPECTROSCOPY,  
SOLIDS), HYDROGEN, FREE RADICALS, DEOXYRIBONUCLEIC  
ACIDS, AMINO ACIDS, GAMMA RAYS (U)

THE FOLLOWING RESEARCH TOPICS ARE BRIEFLY  
SUMMARIZED: ENERGY MIGRATION AND TRANSFER IN INERT  
SOLIDS AT LOW TEMPERATURE; STUDY OF HYDROGEN  
EXCHANGE REACTIONS IN SOLIDS; STUDY OF INFORMATION  
STORAGE MOLECULES; STUDIES OF THE ATTACK BY THERMAL  
H ATOMS AND OH RADICALS ON ORGANIC MATERIALS;  
POLYAMINO ACIDS AN PROTEINS; AND STUDIES OF  
IRRADIATED SINGLE CRYSTALS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 720 473 7/4 7/5  
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

SCAVENGER EFFECTS ON ELECTRONS PRODUCED BY  
GAMMA RAYS AND PHOTOIONIZATION IN ALKALINE  
ICES AT 77 K.

(U)

APR 70 5P HASE, HIROTOMO ; KEVAN, LARRY ;  
CONTRACT: AF-AFOSR-1852-70, AT(11-1)-2086  
PROJ: AF-9750  
TASK: 975002  
MONITOR: AFOSR TR-71-0653

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF PHYSICAL  
CHEMISTRY, V74 N18 P3358-3361 1970.

DESCRIPTORS: (\*RADIATION CHEMISTRY, \*ICE), ELECTRONS,  
GAMMA RAYS, IONIZATION, REACTION KINETICS, PH FACTOR (U)  
IDENTIFIERS: MATRIX ISOLATION TECHNIQUES, \*ELECTRON  
MOBILITY (U)

ACRYLAMIDE IS USED AS AN ELECTRON SCAVENGER IN THE  
RADIOLYSIS AND FERROCYANIDE PHOTOIONIZATION OF 5 AND  
10 MNAOH ICES. THE CONCENTRATION OF ACRYLAMIDE  
REQUIRED TO REDUCE THE  $E(T)(-)$  YIELD TO ONE-  
HALF ITS INITIAL VALUE IS HIGHER FOR GAMMA RADIOLYSIS  
THAN FOR FERROCYANIDE PHOTOIONIZATION BY A FACTOR OF  
ABOUT 3.5. THIS DIFFERENCE IS SHOWN TO BE DUE TO  
THE SPATIAL NONUNIFORMITY OF  $E(M)(-)$  GENERATED  
BY GAMMA RAYS. WITHIN THE FRAMEWORK OF A SIMPLE  
MODEL THE AVERAGE TRAVEL DISTANCE OF  $E(M)(-)$  IS  
56 Å AND 44 Å IN 5 AND 10 MNAOH ICES,  
RESPECTIVELY; FOR BOTH PHOTOIONIZATION-PRODUCED AND  
RADIATION-PRODUCED ELECTRONS. A KINETIC ANALYSIS  
SUGGESTS THAT A HIGH CONCENTRATION OF SOLUTE  
MOLECULES TENDS TO DESTROY TRAPPING SITES IN THE  
ICES. (AUTHOR)

(U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 720 515 20/12 7/5  
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

PHOTOCONDUCTIVITY IN GAMMA-IRRADIATED  
ALKALINE ICE, (U)

APR 70 11P EISELE, IGNATZ ; KEVAN, LARRY ;  
CONTRACT: AF-AFOSR-1852-70  
PROJ: AF-9750  
TASK: 975002  
MONITOR: AFOSR TR-71-0628

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF CHEMICAL  
PHYSICS, V53 N5 P1867-1875, 1 SEP 70.  
SUPPLEMENTARY NOTE: SPONSORED IN PART BY THE ATOMIC  
ENERGY COMMISSION, WASHINGTON, D. C.

DESCRIPTORS: (\*ICE, \*PHOTOCONDUCTIVITY), (\*RADIATION  
CHEMISTRY, ICE), (\*BAND THEORY OF SOLIDS, ICE),  
ELECTRONS, PH FACTOR, SOLUTIONS(MIXTURES), ELECTRON  
TRANSITIONS (U)

IDENTIFIERS: ELECTRON MOBILITY (U)

THE PHOTOCONDUCTIVITY DUE TO RADIATION-PRODUCED  
TRAPPED ELECTRONS IN GLASSY ALKALINE ICE (10M  
NAOH) AT 77K HAS BEEN STUDIED. THE  
TEMPERATURE DEPENDENCE OF THE PHOTOCURRENT FROM 4 TO  
120K AND THE COINCIDENCE OF THE WAVELENGTH  
DEPENDENCE OF THE PHOTOCURRENT WITH THE ABSORPTION  
BAND SHOW THAT NO STABLE BOUND EXCITED STATE EXISTS  
FOR THE TRAPPED ELECTRON. THE RELATION OF THIS  
RESULT TO THE IMPORTANCE OF SHORTRANGE INTERACTIONS  
IN ELECTRON BINDING IS DISCUSSED. IT IS ALSO FOUND  
THAT RADIATION-PRODUCED SHALLOW TRAPS FOR ELECTRONS  
ARE FORMED. THESE TRAPS HAVE AN AVERAGE DEPTH OF  
0.048 EV AND APPEAR TO BE ASSOCIATED WITH A LATTICE  
DISTORTION CREATED BY THE PRESENCE OF O(-).  
BOTH OHMIC AND SUPER-OHMIC CURRENTS ARE FOUND  
UNDER CERTAIN CONDITIONS. THE SUPER-OHMIC  
CURRENT IS INTERPRETED AS DUE TO A VOLTAGE-DEPENDENT  
LIFETIME OF CONDUCTION BAND ELECTRONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 720 741 7/5  
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

LIGHT PRODUCTS OF THE DESTRUCTION OF THE  
BENZENE MOLECULE BY TRITIUM RECOIL ATOMS,

(U)

DEC 70 7P AVDONINA, E. N. ;  
REPT. NO. FTD-HT-23-772-70  
PROJ: FTD-7343

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF KHIMIYA VYSOKIKH  
ENERGII (USSR) V4 N1 P83-84 1970, BY D.  
KOOLBECK.

DESCRIPTORS: (\*BENZENE, RADIATION CHEMISTRY), TRITIATED  
COMPOUNDS, DECOMPOSITION, ALKYNES, NEUTRON REACTIONS,  
USSR (U)  
IDENTIFIERS: RADIOLYSIS, TRANSLATIONS (U)

DURING INVESTIGATION OF THE REACTION OF TRITIUM  
RECOIL ATOMS WITH LIQUID BENZENE IT WAS NOTICED THAT  
IN THE PRESENCE OF IODINE THE ACTIVITY OF THE GASEOUS  
PRODUCTS - FRACTIONS WHICH, IT WAS ASSUMED, CONSISTED  
EXCLUSIVELY OF HT - WAS SOMEWHAT INCREASED.  
GARLAND AND ROWLAND SHOWED DURING A STUDY OF THE  
REACTIONS OF TRITIUM RECOIL ATOMS WITH BENZENE IN THE  
GASEOUS PHASE THAT THE RATIO OF ACTIVITIES OF THE GAS  
FRACTION AND THE PARENT SUBSTANCE GROWS IN THE  
PRESENCE OF OXYGEN AND OF NITRIC OXIDE. TO CLARIFY  
THE REASON FOR THIS EXTREMELY UNEXPECTED PHENOMENON,  
DETERMINATION WAS MADE OF GIVEN TAGGED HYDROCARBONS  
AND THE HIGHLY VOLATILE FRACTION OF THE PRODUCTS FROM  
TRANSFORMATION OF LIQUID BENZENE IRRADIATED IN THE  
PRESENCE OF LITHIUM CARBONATE POWDER BY THERMAL  
NEUTRONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 722 446 7/5 6/15  
AUCKLAND UNIV (NEW ZEALAND)

CHEMISTRY OF RADIATION PROTECTING  
AGENTS.

(U)

DESCRIPTIVE NOTE: FINAL SCIENTIFIC REPT. 1 MAR 68-28  
FEB 71,

FEB 71 14P PACKER, J. E. ;  
CONTRACT: AF-AFOSR-1417-68  
MONITOR: AFOSR TR-71-0944

UNCLASSIFIED REPORT

DESCRIPTORS: (\*RADIOPROTECTIVE AGENTS, \*THIOLS),  
(\*RADIATION CHEMISTRY, THIOLS), SULFUR HETEROCYCLIC  
COMPOUNDS, FREE RADICALS, REACTION KINETICS, KETONES,  
AMINES, NEW ZEALAND (U)

IDENTIFIERS: CHEMICAL REACTION MECHANISMS,  
\*HOMOCYSTEINE, \*CYSTEINE (U)

WORK ON HOMOCYSTEINE THIOLACTONE IS FAIRLY FULLY  
DISCUSSED, WORK ON CYSTEINE IS ALSO REPORTED, THE  
CURRENT SITUATION SUMMARISED, AND THE SIGNIFICANT  
FEATURES OF THE OTHER SYSTEMS STUDIED SUMMARISED.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 723 230 7/5  
DEFENCE RESEARCH ESTABLISHMENT OTTAWA (ONTARIO)

GAMMA-RADIOLYSIS OF CYSTEINE-CYSTEAMINE  
DISULFIDE IN AQUEOUS SOLUTION, (U)

SEP 70 7P PURDIE, J. W. ;  
RLPT. NO. DRE0-627

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN CANADIAN JNL. OF  
CHEMISTRY, V49 N5 P725-730 1971. NO COPIES FURNISHED  
BY DDC OR NTIS.

DESCRIPTORS: (\*SULFIDES, \*RADIATION CHEMISTRY),  
(\*THIOLS, RADIATION CHEMISTRY), FREE RADICALS, OXYGEN,  
AMINES, GAMMA RAYS, CANADA (U)  
IDENTIFIERS: RADIOLYSIS, \*CYSTEINE, \*CYSTEAMINE,  
\*DISULFIDES (U)

GAMMA-RADIOLYSIS OF A MIXED DISULFIDE, CYSTEINE-  
CYSTEAMINE DISULFIDE, IN UNBUFFERED AQUEOUS SOLUTION  
(0.3 MM) WAS INVESTIGATED IN THE PRESENCE AND  
ABSENCE OF OXYGEN. THE PRINCIPAL PRODUCTS WERE THE  
THIOLS (CYSTEINE AND CYSTEAMINE), THE  
CORRESPONDING SULFINIC AND SULFONIC ACIDS, THE  
SYMMETRICAL DISULFIDES (CYSTINE AND CYSTAMINE)  
AND AMMONIA. CYSTINE AND CYSTAMINE WERE FORMED IN  
VERY HIGH YIELDS IN DEAERATED SOLUTION;  
(G(CYSSCY) ABOUT 15) BUT ADDITION OF OXYGEN  
REDUCED THE YIELD SHARPLY AND IT WAS INVERSELY  
PROPORTIONAL TO THE OXYGEN CONCENTRATION EXCEPT AT  
VERY LOW OXYGEN LEVELS. IN AERATED SOLUTION  
G(CYSSCY) = 0.8. THESE OBSERVATIONS WERE  
ATTRIBUTED TO A CHAIN REACTION WHICH WAS SUPPRESSED  
BY OXYGEN. IN THE CASE OF PROTEINS, IT WAS  
CONCLUDED THAT ALTHOUGH CHAIN REACTIONS BETWEEN RS,  
RADICALS AND PROTEIN DISULFIDE BONDS WERE POSSIBLE,  
THEY SHOULD BE INHIBITED BY OXYGEN. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 723 708 7/5  
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

TRAPPED HYDROGEN ATOMS PRODUCED BY GAMMA  
RAYS IN ALCOHOL-WATER MIXTURES AT 77°K. (U)

MAY 70 5P HASE, HIROTOMO ; KEVAN, LARRY ;  
CONTRACT: AF-AFOSR-1852-70  
PROJ: AF-9750  
TASK: 975002  
MONITOR: AFOSR TR-71-1282

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN JNL. OF PHYSICAL  
CHEMISTRY, V74 N18 P3355-3358 1970.

DESCRIPTORS: (\*ALCOHOLS, \*RADIATION CHEMISTRY),  
(\*HYDROGEN, RADIATION CHEMISTRY), WATER, GAMMA RAYS,  
ETHANOLS, CARBINOLS, SOLUTIONS(MIXTURES) (U)  
IDENTIFIERS: RADIOLYSIS (U)

SMALL H(T) YIELDS (G(MAX) ABOUT 0.1) ARE  
OBSERVED IN GAMMA-IRRADIATED MEOH-H<sub>2</sub>O,  
ETOH-H<sub>2</sub>O, AND N-PROH-H<sub>2</sub>O MIXTURES AT  
77K ALTHOUGH H(T) IS NOT OBSERVED IN EITHER  
PURE COMPONENT AT 77K. THE H(T) YIELD SHOWS A  
MAXIMUM AT 0.1 TO 0.3 MOLE FRACTION ALCOHOL; THE  
MAXIMUM OCCURS AT LOWER MOLE FRACTION FOR LONGER  
CHAIN ALCOHOLS. ELECTRONS ARE ALSO TRAPPED IN THE  
MIXTURES AND WHEN THEY ARE PHOTOBLEACHED THE H(T)  
YIELDS SHOW A STRIKING CORRELATION WITH THE EXCESS  
ENTHALPY OF MIXING OF ALCOHOL-WATER MIXTURES; BOTH  
EFFECTS SEEM TO BE RELATED TO ALCOHOL-WATER COMPLEX  
FORMATION. EPR LINE WIDTHS IN DEUTERATED MIXTURES  
GIVEN INFORMATION ON THE TRAPPING SITE STRUCTURE, AND  
THE H(T) YIELDS IN DEUTERATE MIXTURES SUGGEST  
THAT MOST OF THE H(T) COMES FROM THE WATER  
MOLECULES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 724 224 7/5  
AUCKLAND UNIV (NEW ZEALAND) DEPT OF CHEMISTRY

THE RADIOLYSIS OF OXYGENATED CYSTEINE  
SOLUTIONS AT NEUTRAL PH. THE ROLE OF RSSR  
AND OXYGEN. (U)

APR 70 10P BARTON, J. P. ; PACKER, J.  
E. ;

CONTRACT: AF-AFOSR-1417-68  
PROJ: AF-9760  
MONITOR: AFOSR TR-71-1456

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN INTERNATIONAL JNL. FOR  
RADIATION PHYSICS AND CHEMISTRY, V2 P159-166 1970.  
SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH  
MANCHESTER UNIV. (ENGLAND). DEPT. OF  
CHEMISTRY.

DESCRIPTORS: (\*SULFIDES, \*RADIATION CHEMISTRY), REACTION  
KINETICS, GAMMA EMISSION, SOLUTIONS(MIXTURES), THIOLS,  
NEW ZEALAND (U)  
IDENTIFIERS: \*ORGANIC SULFIDES, RADIOLYSIS,  
\*CYSTEINE (U)

IT IS SHOWN THAT THE SPECIES RSSR AND RS.  
FORMED DURING THE PULSE RADIOLYSIS OF AQUEOUS  
SOLUTIONS OF CYSTEINE REACT WITH OXYGEN. THE RATE  
IS CALCULATED. THE REACTION  $RS + O_2 \rightarrow$   
 $RS + H_2O_2$  IS SHOWN TO PROCEED UNDER GAMMA  
RADIOLYSIS CONDITIONS AT PH 7 WITH A RATE CONSTANT  
GREATER THAN  $5 \times 10^4$  TO THE 4TH CU DM/MD-S.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 724 226 7/5

CALIFORNIA INST OF TECH PASADENA DEPT OF CHEMISTRY

RADIATION-INDUCED CHAIN ISOMERIZATION OF CIS-  
1,2-DIPHENYLPROPENE IN CYCLOHEXANE, (U)

JUL 70 5P PENNER, THOMAS L. ; HAMMOND,  
GEORGE S. ;  
CONTRACT: F44620-70-C-0025  
PROJ: AF-9538  
MONITOR: AFOSR TR-71-1463

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF PHYSICAL  
CHEMISTRY, V75 N2 P292-294 1971.  
SUPPLEMENTARY NOTE: ALSO AVAILABLE AS CONTRIB-4099 OF  
GATES AND CRELLIN LABS. OF CHEMISTRY.

DESCRIPTORS: (\*PROPENES, \*RADIATION CHEMISTRY),  
SOLUTIONS(MIXTURES), MOLECULAR ISOMERISM, GAMMA RAYS (U)  
IDENTIFIERS: \*CYCLOHEXANE (U)

AT HIGH CONCENTRATION AND LOW RADIATION DOSEAGES,  
SOLUTIONS OF CIS-1,2-DIPHENYLPROPENE UNDERGO  
GEOMETRICAL ISOMERIZATION BY A CHAIN MECHANISM WHICH  
PRESUMABLY INVOLVES A CATIONIC INTERMEDIATE. UNDER  
THE USUAL CONDITIONS OF LOW CONCENTRATION AND HIGHER  
RADIATION DOSE, THE 1,2-DIPHENYLPROPENES ARE  
EXCELLENT EXCITATION SCAVENGERS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 725 347 7/4

WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

OPTICAL ABSORPTION CHARACTERISTICS AND  
PHOTBLEACHING BEHAVIOR OF TRAPPED ELECTRONS  
IN GAMMA-IRRADIATED ALKALINE ICE, (U)

JUL 70 9P HASE, HIROTOMO ; KEVAN, LARRY ;  
CONTRACT: AF-AFOSR-1852-70  
PROJ: AF-9750  
TASK: 975002  
MONITOR: AFOSR TR-71-1705

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN THE JNL. OF CHEMICAL  
PHYSICS, V54 N3 P908-914, 1 FEB 71.

DESCRIPTORS: (\*ICE, \*RADIATION CHEMISTRY), (\*ULTRAVIOLET  
SPECTRA, ICE), ABSORPTION SPECTRA, ELECTRONS, GAMMA  
RAYS, PH FACTOR, POLARIZATION, HYDROXIDES,  
PHOTOCONDUCTIVITY, (U)PHOTOCONDUCTIVITY (U)  
IDENTIFIERS: QUANTUM EFFICIENCY (U)

TRAPPED ELECTRONS, E(T)(-), ARE PRODUCED BY  
GAMMA IRRADIATION OF ALKALINE ICE (10M NaOH)  
AT 77K. THE E(T)(-) ABSORPTION BAND  
MAXIMUM AT 590 NM SHIFTS TO SHORTER LAMDA FOR  
BLEACHING AT 700 NM AND SHIFTS TO LONGER GAMMA FOR  
BLEACHING AT 400 NM. AFTER PARTIAL BLEACHING,  
ELECTRONS CAN BE SHIFTED BACK AND FORTH BETWEEN  
TRAPS. ALTHOUGH THIS SUGGESTS AT LEAST TWO TRAP  
DEPTHS, THERE IS PROBABLY A BROAD SPECTRUM OF TRAP  
DEPTHS. THE QUANTUM EFFICIENCY FOR PHOTBLEACHING  
E(T)(-) IS 0.15 AND INDEPENDENT OF LAMDA WHEN  
THE OPTICAL DENSITY IS MEASURED AT 590 NM. ALL OF  
THE CHANGES ARE EXPLAINED BY RETRAPPING AND TRAP  
INTERCONVERSION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 725 940 11/9  
PLASTICS TECHNICAL EVALUATION CENTER DOVER N J

APPLICATIONS OF IONIZING RADIATIONS IN  
PLASTICS AND POLYMER TECHNOLOGY. (U)

DESCRIPTIVE NOTE: REPT. FOR 1960-1970,  
MAR 71 268P READDY, ARTHUR F. , JR;  
REPT. NO. PLASTEC-41

UNCLASSIFIED REPORT  
AVAILABILITY: NO COPIES FURNISHED BY DDC. ORDER  
DIRECTLY FROM NTIS.

DESCRIPTORS: (\*PLASTICS, \*RADIATION CHEMISTRY),  
(\*POLYMERS, RADIATION CHEMISTRY), (\*POLYMERIZATION,  
RADIATION CHEMISTRY), (\*REVIEWS, PLASTICS), GAMMA RAYS,  
ELECTRON BEAMS, CROSSLINKING(CHEMISTRY), POLYETHYLENE  
PLASTICS, SILICONE PLASTICS, POLYVINYL CHLORIDE, NYLON,  
THERMOPLASTIC RESINS, COPOLYMERIZATION, PLASTIC PAINTS,  
AGING(MATERIALS), PLASTIC COATINGS, POLYESTER PLASTICS,  
REINFORCED PLASTICS, WOOD, CONCRETE, ADHESIVES, ACRYLIC  
RESINS, STYRENE PLASTICS, COSTS, ELECTRIC INSULATION,  
PACKAGING, COMPOSITE MATERIALS (U)  
IDENTIFIERS: ACRYLONITRILE COPOLYMERS, COBALT 60,  
\*PLASTIC WOOD COMPOSITES, POLYIMIDE RESINS,  
POLYBUTADIENE, POLYPROPYLENE, POLYVINYLIDENE FLUORIDE,  
\*RADIATION POLYMERIZATION, \*GRAFT POLYMERIZATION,  
\*IONIZING RADIATION, \*CONCRETE POLYMER COMPOSITES (U)

THE ACTUAL AND POTENTIAL USES OF HIGH ENERGY  
IONIZING RADIATIONS IN PROCESSING OF MODIFYING  
POLYMERS, PARTICULARLY PLASTICS, ARE SURVEYED.  
INCLUDED ARE DISCUSSIONS OF: THOSE METHODS AND  
END-PRODUCTS WHICH HAVE REACHED COMMERCIAL STATUS;  
ADVANCED DEVELOPMENTS AND PILOT PLANT STUDIES WITH  
WELL-DEFINED MARKET POTENTIALLY; AND PRELIMINARY OR  
PROTOTYPE WORK WHICH MAY EVENTUALLY GAIN COMMERCIAL  
ACCEPTANCE. DETAILS ARE GIVEN ON IRRADIATION  
TECHNOLOGY, PRODUCTS MODIFICATION (WITH RESULTANT  
PROPERTIES AND RELATED DATA) AND OVERALL PROCESS  
ECONOMICS. THESE IMPORTANT TOPICS ARE COMPLEMENTED  
BY LIMITED DISCUSSIONS OF THE PHYSICS AND CHEMISTRY  
OF THE IRRADIATED POLYMER SUBSTRATES. THE LAST  
SECTION GIVES A FEW PROJECTIONS AND DEVELOPMENTS IN  
THE TECHNOLOGY WHICH ARE REQUIRED FOR FURTHER  
EFFICIENCIES AND ECONOMIES. SUCH DEVELOPMENTS WILL  
LEAD TO ACCELERATED ACCEPTANCE OF IONIZING RADIATION  
METHODS AND THE RESULTANT END-ITEMS. (AUTHOR-PL) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 727 949 7/5  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER CHARLOTTESVILLE  
VA

INVESTIGATION OF THE KINETIC AND SPECTRAL  
CHARACTERISTICS OF THE PRIMARY PARTICLE IN  
PULSE RADIOLYSIS,

(U)

JUL 71 31P SHUBIN, V. N. ; KABAKCHI, S.  
A. ; BERUCHASHVILI, L. P. ; DOLIN, P. I. ;  
REPT. NO. FSTC-HT-23-323-71

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF UNIDENTIFIED JNL.

DESCRIPTORS: (\*RADIATION CHEMISTRY, REACTION KINETICS),  
SOLUTIONS, NITRATES, HYDROXIDES, SPECTRA (VISIBLE +  
ULTRAVIOLET), USSR

(U)

IDENTIFIERS: TRANSLATIONS

(U)

THE AIM OF THE WORK WAS TO MAKE CLEAR SOME  
CHARACTERISTIC FEATURES OF THE KINETICS OF  
INTERACTION BETWEEN ACCEPTORS AND THE PRIMARY  
REDUCING PARTICLES FORMED BY RADIOLYSIS OF AQUEOUS  
ALKALINE SOLUTIONS. THE DECAY KINETICS OF THE  
PRIMARY SPECIES WITH  $\lambda_{\text{MAX}} = 720 \text{ NM}$  HAS BEEN  
STUDIED IN AQUEOUS SOLUTIONS, SATURATED WITH HYDROGEN  
OR HELIUM, CONTAINING KOH, OXYGEN, AND SODIUM  
NITRATE, AND SUBJECTED TO PULSE RADIOLYSIS USING A  
SMEV LINEAR ELECTRON ACCELERATOR. THE DOSE PER  
PULSE WAS VARIED FROM 150 TO 3,000 RAD.

(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 728 570 7/5  
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

ELECTRON PARAMAGNETIC RESONANCE INVESTIGATION  
OF IRRADIATED LITHIUM ACETATE DIHYDRATE AND  
MERCURIC ACETATE SINGLE CRYSTALS. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,  
JUN 71 94P CONEWAY, CLINTON JAMES ;

UNCLASSIFIED REPORT

DESCRIPTORS: (\*ACETATES, \*RADIATION CHEMISTRY), (\*FREE  
RADICALS, ACETATES), PARAMAGNETIC RESONANCE, LITHIUM  
COMPOUNDS, MERCURY COMPOUNDS, HYDRATES, HYPERFINE  
STRUCTURE, SINGLE CRYSTALS, THESES (U)  
IDENTIFIERS: MERCURY(II) ACETATE, CARBANIONS, ELECTRON  
PARAMAGNETIC RESONANCE (U)

AN ELECTRON PARAMAGNETIC RESONANCE STUDY OF X-RAY  
IRRADIATED SINGLE CRYSTALS OF LITHIUM ACETATE  
DIHYDRATE AND MERCURIC ACETATE HAS BEEN MADE. THE  
CH<sub>2</sub>(.)CO<sub>2</sub>(-) RADICAL HAS BEEN IDENTIFIED IN  
LITHIUM ACETATE DIHYDRATE IRRADIATED AT LIQUID  
NITROGEN TEMPERATURE. THE HCH ANGLE WAS FOUND.  
THE PRINCIPLE ELEMENTS OF THE HYPERFINE TENSOR AND  
THE G TENSOR WERE CALCULATED. MERCURIC ACETATE  
IRRADIATED AT LIQUID NITROGEN TEMPERATURE SHOWED THE  
PRESENCE OF TWO CO<sub>2</sub>(-) SPECIES. SPECTRA AT -  
80C SHOWED THE PRESENCE OF TWO CH<sub>2</sub>(.)CO<sub>2</sub>(-  
) RADICALS. THE PRINCIPAL VALUES OF THE  
HYPERFINE TENSOR FOR THE TWO MAGNETICALLY DISTINCT  
SITES WERE OBTAINED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 728 954 7/4  
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

ELECTRON PARAMAGNETIC RESONANCE INVESTIGATION  
OF FOREIGN RADICAL IONS IN IRRADIATED  
STRONTIUM AND ZINC ACETATE SINGLE  
CRYSTALS. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,  
JUN 71 48P ONEY, WILLIAM EDWARD, JR;

UNCLASSIFIED REPORT

DESCRIPTORS: (\*ACETATES, \*RADIATION CHEMISTRY),  
(\*RADIATION DAMAGE, ACETATES), IMPURITIES, FREE  
RADICALS, DOPING, STRONTIUM COMPOUNDS, ZINC COMPOUNDS,  
PARAMAGNETIC RESONANCE, HYPERFINE STRUCTURE, THESES (U)  
IDENTIFIERS: BUTYRATES, ELECTRON PARAMAGNETIC  
RESONANCE (U)

AN EPR STUDY OF X-RAY IRRADIATED ISOBUTYRATE AND  
N-BUTYRATE DOPED STRONTIUM ACETATE HEMIHYDRATE HAS  
BEEN MADE. THE N-BUTYRATE RADICAL EXHIBITED  
ANISOTROPY WHILE THE ISOBUTYRATE DID NOT. THE N-  
BUTYRATE RADICAL ION HAS A SPECTRUM OF 8 LINES OF  
EQUAL INTENSITY. THE UNPAIRED ELECTRON IS ON THE  
ALPHA CARBON AND THE TWO BETA CARBON HYDROGENS ARE  
INEQUIVALENT. THE N-BUTYRATE RADICAL HAS BEEN  
SHOWN TO BE ORIENTED IN VERY NEARLY THE SAME POSITION  
AS THE PROPIONATE RADICAL PREVIOUSLY REPORTED AND IT  
OCCUPIES ONLY ONE OF THE TWO ACETATE SITES. WITHIN  
THIS SITE ONLY ONE ROTAMER OF THE DAMAGED ION IS  
THERMALLY POPULATED. THE ISOBUTYRATE ION IS  
SELECTIVELY DAMAGED BY A RATIO OF 300 TO 1, AND THE  
RATIO FOR N-BUTYRATE IS ABOUT 500 TO 1.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 729 573 7/5  
DEFENCE STANDARDS LABS MARIBYRNONG (AUSTRALIA)

THE EFFECTS OF NITROUS OXIDE AND ETHYLENE  
ON THE GAS YIELDS AND GEL FORMATION FROM  
GAMMA-IRRADIATED POLYPROPYLENE, (U)

NOV 70 14P PINKERTON, D. M. ;

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN AUSTRALIAN JNL. OF  
CHEMISTRY, V24 P1619-1632 1971. NO COPIES FURNISHED BY  
DDC OR NTIS.

DESCRIPTORS: (\*POLYMERS, RADIATION CHEMISTRY),  
(\*CROSSLINKING(CHEMISTRY), \*RADIATION CHEMISTRY), GAMMA  
RAYS, NITROGEN OXIDES, ETHYLENES, FREE RADICALS,  
AUSTRALIA (U)  
IDENTIFIERS: NITROGEN OXIDE(N2O), CHEMICAL REACTION  
MECHANISMS, \*POLYPROPYLENE, \*RADIATION POLYMERIZATION,  
\*FREE RADICAL SCAVENGERS (U)

ISOTACTIC AND ATACTIC POLYPROPYLENE HAVE BEEN  
GAMMA-IRRADIATED IN A VACUUM, IN NITROUS OXIDE, AND  
IN ETHYLENE, AND ALSO IN THE PRESENCE OF MIXTURES OF  
THESE TWO GASES. THE GAMMA-IRRADIATION OF THE  
ISOTACTIC POLYPROPYLENE IN A VACUUM GIVES A H2  
YIELD WHICH IS NON-LINEAR WITH DOSE, WHEREAS THE  
CH4 YIELD IS LINEAR WITH DOSE. YIELDS OF H2  
AND CH4 FROM ATACTIC POLYPROPYLENE OBEY A LINEAR  
RELATIONSHIP WITH THE DOSE DELIVERED. BOTH N2O  
AND ETHYLENE DEPRESS THE G(H2) OBTAINED FROM  
VACUUM IRRADIATIONS OF ISOTACTIC POLYPROPYLENE, THE  
FORMER DUE TO ELECTRON SCAVENGING AND THE LATTER TO  
HYDROGEN ATOM SCAVENGING. COMPARED TO VACUUM  
IRRADIATIONS, N2O ENHANCES, AND ETHYLENE  
SUPPRESSES COMPLETELY, THE CROSSLINKING YIELD IN  
ISOTACTIC POLYPROPYLENE. IN MIXTURES, THE RESULTS  
ARE CONSISTENT WITH ETHYLENE PARTICIPATING IN THE  
ENERGY TRANSFER REACTION IN PREFERENCE TO THE N2O  
AND SO INHIBITING THE ADDITIONAL CROSSLINKING THAT  
N2O CAUSES THROUGH THE DEHYDROGENATION REACTION.  
A TENTATIVE REACTION SEQUENCE IS PROPOSED.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 20M07

AD- 730 206 7/5 20/12  
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

EPR STUDIES OF MULTIPLE SILVER ATOM  
TRAPPING SITES PRODUCED IN GAMMA-IRRADIATED  
FROZEN SILVER NITRATE ICES, (U)

MAR 71 11P KEVAN, LARRY ; BALES, BARNEY

L. ;

CONTRACT: AF-AFOSR-1852-70  
PROJ: AF-9750  
TASK: 975002  
MONITOR: AFOSR TR-71-2466

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN THE JNL. OF CHEMICAL  
PHYSICS, V55 N3 P1327-1336, 1 AUG 71.

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH SAN  
FERNANDO VALLEY STATE COLL., NORTHRIDGE, CALIF.  
DEPT. OF PHYSICS AND ASTRONOMY.

DESCRIPTORS: (\*SILVER COMPOUNDS, \*RADIATION CHEMISTRY),  
(\*PARAMAGNETIC RESONANCE, \*SILVER), CRYSTAL LATTICE  
DEFECTS, ATOMS, ICE, GAMMA RAYS, DIPOLE MOMENTS (U)  
IDENTIFIERS: POTASSIUM FLUORIDE, SILVER NITRATE,  
\*VACANCIES (CRYSTAL DEFECTS), \*ELECTRON PARAMAGNETIC  
RESONANCE (U)

EPR STUDIES SHOW THAT GAMMA-IRRADIATED  $AgNO_3 \cdot$   
 $KF$  AND  $AgNO_3$  ICES AT 77K FORM  $Ag$  IN SEVERAL  
MAGNETICALLY DISTINCT SITES. TEMPERATURE AND  
OPTICAL EXCITATION CAUSE CONVERSIONS AMONG THESE  
SITES WITH LITTLE LOSS OF  $Ag$ . FROM 77 TO 150K  
THE PREDOMINANT CHANGE IS FROM A MATRIX SITE  
CHARACTERIZED BY A SYMMETRIC ELECTRIC FIELD TO A  
MATRIX SITE CHARACTERIZED BY AN ASYMMETRIC ELECTRIC  
FIELD. THIS IS EXPLAINED IN TERMS OF WATER DIPOLE  
ROTATION IN RESPONSE TO THE REMOVAL OF THE ELECTRIC  
FIELD OF  $Ag(+)$  UPON FORMATION OF  $Ag$ . THE  
ACTIVATION ENERGIES ARE DISCUSSED IN TERMS OF L-  
DEFECT FORMATION AND MOTION OF THE ICE MATRIX.  
OPTICAL STUDIES SHOW THAT UV LIGHT CONVERTS  
 $Ag_2(+)$  TO  $Ag$  IN A SYMMETRIC SITE AND THAT  
VISIBLE LIGHT CONVERTS  $Ag$  FROM A SYMMETRIC TO AN  
ASYMMETRIC SITE AND PARTLY BACK TO  $Ag_2(+)$ .  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 730 383 20/12 7/5  
UNIVERSITY COLL DUBLIN (IRELAND) DEPT OF CHEMISTRY  
ENERGY MIGRATION IN IRRADIATED SOLIDS. (U)

DESCRIPTIVE NOTE: FINAL SCIENTIFIC REPT. 1 APR 67-30  
MAR 71,

JUN 71 47P CUNNINGHAM, JOSEPH ;  
CONTRACT: F61052-67-C-0044

PROJ: AF-9750

TASK: 975001

MONITOR: AFOSR TR-71-2402

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SEMICONDUCTORS, RADIATION CHEMISTRY),  
ULTRAVIOLET RADIATION, PHOTOCONDUCTIVITY,  
PHOTOCHEMISTRY, OXIDES, ZINC COMPOUNDS, HALOGENATED  
HYDROCARBONS, EIRE (U)  
IDENTIFIERS: METHYL IODIDE, NITROGEN OXIDE(N2O) (U)

EVIDENCE FOR ENERGY MIGRATION OVER DISTANCES CA. 10  
NM IN SEMICONDUCTING SOLIDS FOLLOWS FROM RESULTS  
OBTAINED ON ENERGY TRANSFER AT ILLUMINATED GAS/  
SEMICONDUCTOR AND AQUEOUS SOLUTION/  
SEMICONDUCTOR INTERFACES. CHEMICAL CHANGES AT  
GAS/SEMICONDUCTOR INTERFACES IN THE DARK INVOLVED  
ELECTRON LOCALIZATION BY ADSORBED MOLECULES AS SHOWN  
BY STUDIES OF CONDUCTIVITY, ELECTRON SPIN RESONANCE  
AND KINETICS. ADDITIONAL CHEMICAL REACTION WAS  
OBSERVED WHEN THESE DARK-EQUILIBRATED INTERFACES WERE  
EXPOSED TO U.V. LIGHT. FOR N2O(G)/  
ZNO(S), OBSERVED PHOTOCONDUCTIVITY AND KINETIC  
RESULTS WERE CONSISTENT WITH MIGRATION OF PHOTO-  
PRODUCED HOLES TO THE INTERFACE FOLLOWED BY ELECTRONS  
BUT THE QUANTUM EFFICIENCY WAS ONLY 0.00001. FOR  
CD3I(G)/ZNO(S), RESULTS WERE MORE  
CONSISTENT WITH MIGRATION OF EXCITONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 734 717 7/4  
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF  
PHYSICS

OPTICAL MEASUREMENTS ON SOLVATED ELECTRONS IN  
PULSE-IRRADIATED LIQUID PROPANE, (U)

JUN 71 3P GILLIS, H. A. ; KLASSEN, N.  
V. ; TEATHER, G. G. ; LOKAN, K. H. ;  
MONITOR: NRC 12104

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN CHEMICAL PHYSICS  
LETTERS, V10 N4 P481-483, 15 AUG 71. NO COPIES  
FURNISHED BY DDC OR NTIS.

DESCRIPTORS: (\*PROPANES, \*SOLVENT ACTION), (\*RADIATION  
CHEMISTRY, PROPANES), ELECTRONS, SPECTRA (INFRARED),  
CANADA (U)  
IDENTIFIERS: \*SOLVATED ELECTRONS (U)

A BROAD ABSORPTION SPECTRUM WITH  $\lambda(\text{MAX}) > \text{OR}$   
 $= 2000 \text{ NM}$  HAS BEEN OBSERVED IN PULSE-IRRADIATED  
LIQUID PROPANE AT LOW TEMPERATURES, AND ASSIGNED TO  
THE SOLVATED ELECTRON. THE ELECTRON DECAYS BY  
GEMINATE RECOMBINATION WITH AN INITIAL HALF-LIFE OF  
 $< \text{OR} = 95 \text{ NSEC}$  AT  $-185\text{C}$ . (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 734 719 7/4  
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF  
PHYSICS

SOLVATED ELECTRONS IN DIMETHYLSULPHOXIDE, (U)

JUL 71 3P WALKER, D. C. ;KLASSEN, N.  
V. ;GILLIS, H. A. ;  
MONITOR: NRC 12140

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN CHEMICAL PHYSICS  
LETTERS, V10 N5 P636-638, 1 SEP 71. NO COPIES  
FURNISHED BY DDC OR NTIS.

DESCRIPTORS: (\*SULFOXIDES, \*SOLVENT ACTION), (\*RADIATION  
CHEMISTRY, SULFOXIDES), ELECTRONS, SPECTRA(INFRARED),  
CANADA (U)

IDENTIFIERS: \*METHYL SULFOXIDE, \*SOLVATED  
ELECTRONS (U)

THE OPTICAL ABSORPTION SPECTRUM OBTAINED BY PULSE  
RADIOLYSIS OF PURE LIQUID DIMETHYLSULPHOXIDE INCLUDES  
A BROAD INTENSE BAND IN THE NEAR IR WITH  
LAMBDA(MAX= OR > 1500 NM. THIS BAND IS ASSIGNED  
TO SOLVATED ELECTRONS WITH A HALF-LIFE OF 15 PLUS OR  
MINUS 2 NSEC. THE LAMBDA(MAX) OF THE SOLVATED  
ELECTRON CORRELATES BETTER WITH DIMETHYLSULPHOXIDE'S  
INABILITY TO SOLVATE NEGATIVE IONS THAN WITH ITS  
DIELECTRIC CONSTANT, WHICH IS 48. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 734 848 7/5  
NEWCASTLE-UPON-TYNE UNIV (ENGLAND) DEPT OF ORGANIC  
CHEMISTRY

GAMMA-RADIOLYSIS OF TERTIARY AROMATIC  
AMINES. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT.,  
OCT 71 19P KHANDELWAL, G. D. ; SWAN, G.  
A. ;

CONTRACT: DAJA37-70-C-0234  
PROJ: DA-2-061102-B-13-B  
MONITOR: ARDG(E) E-1371

UNCLASSIFIED REPORT

DESCRIPTORS: (\*AMINES, \*RADIATION CHEMISTRY), AROMATIC  
COMPOUNDS, GAMMA RAYS, N-HETEROCYCLIC COMPOUNDS, FREE  
RADICALS (U)  
IDENTIFIERS: ANILINE/N-N-DIETHYL, ANILINE/N-N-  
DIMETHYL, CHLOROBENZENE, \*RADIOLYSIS (U)

EARLIER RESEARCH ON THE GAMMA-RADIOLYSIS OF  
TERTIARY AROMATIC AMINES SUCH AS NN-DIMETHYLANILINE  
HAS BEEN EXTENDED TO AMINES IN WHICH BETA HYDROGEN IS  
PRESENT E.G. L-PHENYLPYRROLIDINE, 1-PHENYLPYPERIDINE  
AND NN-DIETHYLANILINE. UNLIKE THE N-METHYL  
COMPOUNDS, THESE LATTER YIELD DIMERIC PRODUCTS WHICH  
ARE NOT FORMED BY SIMPLE RADICAL COUPLINE. THE  
ACTION OF T-BUTOXY RADICALS ON TERTIARY AROMATIC  
AMINES SOMETIMES LEADS TO THE SAME PRODUCTS AS DOES  
GAMMA-RADIOLYSIS. HOWEVER, THE ACTION OF T-BUTOXY  
RADICALS ON NN-DIMETHYLANILINE IN CHLOROBENZENE IS  
COMPLICATED. RESEARCH ON THE FORMATION OF QUINOLINE  
DERIVATIVES BY RADIOLYSIS OF NN-DIMETHYLANILINE IN  
THE PRESENCE OF N-PHENYLMALEIMIDE HAS BEEN EXTENDED  
BY THE USE OF DIETHYL MALEATE IN PLACE OF N-  
PHENYLMALEIMIDE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 736 905 7/5 7/3  
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

METHOD OF PREPARING IODINATED  
PERFLUOROCARBONS, (U)

NOV 71 8P ZIMIN, A. V. ; VAYNSHTEIN, B.  
I. ; BUCHNEVA, A. P. ;  
REPT. NO. FTD-HT-23-1282-71  
PROJ: AF-7343

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF PATENT (USSR) 173  
213 2P 1970, BY DEAN KOOLBECK.

DESCRIPTORS: (\*HALOGENATED HYDROCARBONS, \*HALOGENATION),  
(\*RADIATION CHEMISTRY, HALOGENATION), PATENTS,  
IONIZATION, IODINE, IODINE COMPOUNDS, FLUORINE  
COMPOUNDS, ALKENES, ADDITION REACTIONS, USSR (U)

IDENTIFIERS: \*FLUORINE ALIPHATIC COMPOUNDS, \*IODINE  
ALIPHATIC COMPOUNDS, \*IODINATION, TRANSLATIONS,  
ETHYLENE/TETRACHLORO (U)

THE RUSSIAN PATENT DESCRIBES A METHOD OF  
OBTAINING IODINATED PERFLUOROCARBONS FROM CRYSTALLINE  
IODINE AND LIQUID UNSATURATED PERFLUOROCARBONS. IT  
IS DISTINGUISHED BY THE FACT THAT IN ORDER TO  
INCREASE THE EFFECTIVENESS OF THE PROCESS, THE  
REACTION MIXTURE IS BROUGHT TO THE PSEUDOBOILING  
STATE OR TO A STATE OF INTENSIVE AGITATION AND IS  
IRRADIATED WITH IONIZING RADIATION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 737 499 7/5  
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

RADIATION CHEMISTRY OF FROZEN NONPOLAR AND  
SLIGHTLY POLAR SYSTEMS, (U)

71 65P KEVAN, LARRY ;  
CONTRACT: AF-AFOSR-1852-70, AT(11-1)-2086  
PROJ: AF-9750  
TASK: 975002  
MONITOR: AFOSR TR-72-0431

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN ACTIONS CHIMIQUES ET  
BIOLOGIQUES DES RADIATIONS, V15 P81-143 1971.

DESCRIPTORS: (\*RADIATION CHEMISTRY, \*REVIEWS), SOLIDS,  
ETHERS, AMINES, KETONES, ALKENES, ALKANES, PARAMAGNETIC  
RESONANCE, FREE RADICALS, FURANS, IONIZATION, ELECTRONS,  
NITRILES, ACETONES, LUMINESCENCE, ELECTRON TRANSITION(U)  
IDENTIFIERS: MATRIX ISOLATION TECHNIQUES,  
PHOTOIONIZATION, TETRAHYDROFURAN/2-METHYL,  
TRIETHYLAMINE, ELECTRON ACCEPTORS, ELECTRON  
PARAMAGNETIC RESONANCE (U)

THE RADIATION CHEMISTRY OF FROZEN SYSTEMS INCLUDING  
ETHERS, AMINES, KETONES, ALKENES AND ALKANES IS  
REVIEWED. THE DETECTION, REACTIVITY, TRAPPING,  
TRAPPING SITE STRUCTURE, SPATIAL DISTRIBUTION, AND  
PARTICIPATION IN ENERGY TRANSFER OF RADIOLYTIC  
INTERMEDIATES IS SUMMARIZED AND EVALUATED. THE  
EMPHASIS IS PLACED ON FACTS ESTABLISHED FOR IONIC  
INTERMEDIATES BY ELECTRON PARAMAGNETIC RESONANCE,  
OPTICAL ABSORPTION, LUMINESCENCE AND CONDUCTIVITY  
MEASUREMENTS, AND CORRELATION BETWEEN THESE DIFFERENT  
TYPES OF MEASUREMENTS IS ANALYZED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 741 551 7/5

WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

OPTICAL BLEACHING EFFECTS ON THE PARAMAGNETIC  
RELAXATION OF TRAPPED ELECTRONS IN  
METHYLTETRAHYDROFURAN AT 77K,

(U)

OCT 71 5P LIN, DING PING ; KEVAN, LARRY

CONTRACT: AF-AFOSR-1852-70

PROJ: AF-975U

MONITOR: AFOSR TR-72-0988

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN THE JNL. OF PHYSICAL  
CHEMISTRY, V76 N5 P636-639 1972.

DESCRIPTORS: (\*ELECTRONS, \*RADIATION CHEMISTRY),  
RELAXATION TIME, FURANS, PARAMAGNETIC RESONANCE, FREE  
RADICALS, EXCITATION, CRYOGENICS (U)  
IDENTIFIERS: SPIN SPIN INTERACTIONS (U)

OPTICAL BLEACHING OF ELECTRONS TRAPPED IN GLASSY  
MATRICES IS EXPECTED TO REMOVE ELECTRONS  
HOMOGENEOUSLY THROUGHOUT THE SYSTEM. THIS SHOULD  
HAVE A PREDICTABLE EFFECT ON THE RELAXATION TIME OF  
THE ELECTRONS AS MEASURED BY T2 (THE SPIN-SPIN  
RELAXATION TIME) DEPENDING ON THE INITIAL SPATIAL  
DISTRIBUTION. IN THIS WORK THE AUTHORS TEST THIS  
CONJECTURE ON ELECTRONS TRAPPED IN  
METHYLTETRAHYDROFURAN (MTHF) AT 77K AND CONFIRM  
THE SPUR MODEL OF ELECTRON TRAPPING IN THIS MATRIX.  
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 742 077 14/3 7/5  
ARMED FORCES RADIOBIOLOGY RESEARCH INST BETHESDA MD

DIGITAL RECORDING OF EAST NONRECURRENT  
PHENOMENA IN PULSE RADIOLYSIS STUDIES. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,  
APR 72 13P MEABURN, G. M. ; ISAACS, B.  
M. ;

REPT. NO. AFRI-TN72-2  
PROJ: DNA-NWER-XAXM  
TASK: C907

UNCLASSIFIED REPORT

DESCRIPTORS: (\*DIGITAL RECORDING SYSTEMS, \*RADIATION  
CHEMISTRY), DESIGN, LABORATORY EQUIPMENT, REACTION  
KINETICS, ANALOG-TO-DIGITAL CONVERTERS (U)  
IDENTIFIERS: PULSE RADIOLYSIS, \*RADIOLYSIS (U)

A NEW SYSTEM IS DESCRIBED FOR DIGITAL RECORDING OF  
ANALOG SIGNALS IN THE MICROSECOND RANGE. THE  
EQUIPMENT IS BUILT AROUND A BIOMATION 610 TRANSIENT  
RECORDER AND TAKES ADVANTAGE OF THE FAST RESPONSE OF  
THE INSTRUMENT'S ANALOG TO DIGITAL CONVERTER. THE  
WIDE FREQUENCY RANGE OF THE SYSTEM (DC TO 2.5  
MHZ) PERMITS DIGITAL RECORDING OF A RAPIDLY  
CHANGING NONRECURRENT SIGNAL WITH STORAGE ON PUNCHED  
PAPER TAPE AS AN INTERMEDIATE STEP PRIOR TO FURTHER  
ANALYSIS. SOME OF THE DESIGN FEATURES ARE  
DISCUSSED. THE EQUIPMENT IS BEING USED IN PULSE  
RADIOLYSIS STUDIES TO DIGITIZE PHOTOELECTRIC SIGNALS  
CORRESPONDING TO THE CHANGING OPTICAL ABSORPTION  
PROPERTIES OF SHORT-LIVED CHEMICAL SPECIES.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 742 651 7/5  
CALIFORNIA UNIV DAVIS DEPT OF CHEMISTRY  
MOLECULAR POLARIZABILITY AS A BASIS FOR  
ENERGY PARTITIONING ESTIMATES IN ORDINARY  
RADIOLYSIS,

(U)

DEC 71 6P ROOT, JOHN W. ; LUCAS, LARRY  
L. ;  
CONTRACT: AF-AFOSR-1493-68  
PROJ: AF-9538  
MONITOR: AFOSR TR-72-1148

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN CHEMICAL PHYSICS  
LETTERS, V13 N1 P65-69 FEB 72.

DESCRIPTORS: (\*RADIATION CHEMISTRY, POLARIZATION),  
ELECTRON IRRADIATION, DIFFERENTIAL CROSS SECTIONS,  
CHEMICAL BONDS, ABSORPTION  
IDENTIFIERS: RADIOLYSIS

(U)

(U)

INDEPENDENT ASSESSMENTS OF RELATIVE ENERGY  
DEPOSITION IN MIXTURES BASED UPON LOW VELOCITY PROTON  
STOPPING CROSS SECTIONS OR UPON RADIOLYTIC IONIZATION  
YIELDS SUGGEST THAT THE EFFECTIVE ENERGY DEPOSITION  
DURING RADIOLYSIS IS PROPORTIONAL TO MOLECULAR  
POLARIZABILITY. THE RESULTS INDICATE THAT ENERGY  
PARTITIONING ESTIMATES BASED UPON THE SIMPLE  
MIXTURE LAW WILL BE GROSSLY INACCURATE IN SYSTEM  
CONTAINING HALOCARBONS OR RARE GASES. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 743 172 6/18 7/5  
EDGEWOOD ARSENAL MD

CERIC/CUPRIC DOSIMETRY: 5 KILORADS TO 50  
MEGARADS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. SEP 67-DEC 70,  
MAY 72 23P BOWIE, DONALD R. ;  
REPT. NO. EA-TR-4527  
PROJ: DA-1-T-061101-A-91-A

UNCLASSIFIED REPORT

DESCRIPTORS: (\*DOSIMETERS, CHEMICAL REACTIONS), (\*CERIUM  
COMPOUNDS, DOSIMETERS), (\*RADIATION CHEMISTRY, CERIUM  
COMPOUNDS), COPPER COMPOUNDS, GAMMA RAYS, IMPURITIES (U)  
IDENTIFIERS: \*CHEMICAL DOSIMETERS, COBALT 60 (U)

THE CERIC/CUPRIC CHEMICAL DOSIMETER WAS  
INVESTIGATED USING COBALT-60 RADIATION AT FIVE  
CONCENTRATIONS OVER A DOSE RANGE OF 5 KILORADS TO 50  
MEGARADS. A G-VALUE OF 2.17 PLUS OR MINUS 0.01  
WAS DETERMINED FOR CERIC CONCENTRATIONS FROM 1 TO 400  
MILLIMOLAR, WITH A SLIGHTLY HIGHER VALUE FOR 0.20  
MM. THE YIELD OF 100 AND 400 MM SOLUTIONS IS  
AFFECTED BY COMPETING REACTIONS, AND CORRECTION  
FACTORS MUST BE APPLIED. SPECTROPHOTOMETRIC  
ANALYSIS COMBINED WITH AUTOMATIC DILUTION TECHNIQUES  
WAS FOUND TO BE A CONVENIENT AND RELIABLE METHOD OF  
ANALYSIS. EVEN UNDER ADVERSE CONDITIONS THE  
PRECISION OBTAINED WITH THE SYSTEM APPROACHED THAT OF  
THE FRICKE DOSIMETER. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 743 628 7/5  
DUKE UNIV DURHAM N C DEPT OF PHYSICS

OBSERVATIONS OF TRIPLET-STATE RADICALS IN  
IRRADIATED SINGLE CRYSTALS OF CARBAZIDE, (U)

JUN 71 6P REISS, KEITH ; GORDY, WALTER ;  
CONTRACT: DA-ARO-D-31-124-71-G23  
MONITOR: AROD 9491:1-P

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN THE JNL. OF CHEMICAL  
PHYSICS, V55 N11 P5329-5333, 1 DEC 71.

DESCRIPTORS: (\*ORGANIC NITROGEN COMPOUNDS, \*FREE  
RADICALS), (\*RADIATION CHEMISTRY, ORGANIC NITROGEN  
COMPOUNDS), GAMMA RAYS, ELECTRON PARAMAGNETIC RESONANCE,  
HEAT OF ACTIVATION (U)

THE ESR OF CARBAZIDE (NH<sub>2</sub>NHCONHNH<sub>2</sub>) AFTER  
GAMMA IRRADIATION AT 77K EXHIBITS SIGNALS  
CORRESPONDING TO AN EFFECTIVE G VALUE OF 4 IN  
ADDITION TO THE COMPONENTS CENTERED AT G=2. THESE  
HALF-FIELD LINES CORRESPOND TO SECOND-ORDER DELTA  
MS=PLUS OR MINUS 2 TRANSITIONS OF A SPIN TRIPLET  
STATE WHICH RESULT FROM ISOTROPIC EXCHANGE COUPLINGS  
OF ELECTRONIC SPIN CENTERS LOCATED ON TWO NH  
FRAGMENTS. THERE ARE TWO DISTINGUISHABLE BIRADICAL  
ORIENTATIONS FOR WHICH SEPARATE SPECTRA OCCUR.  
EXCEPT FOR THIS DIFFERENCE IN ORIENTATION THE  
BIRADICALS ARE IDENTICAL. IN ADDITION TO THE  
BIRADICALS, OTHER UNIDENTIFIED RADICALS HAVING ONLY  
ONE UNPAIRED ELECTRON ARE OBSERVED. ANALYSIS OF THE  
TEMPERATURE DEPENDENCE OF THE BIRADICAL HALF-LIFE BY  
ISOTHERMAL ANNEALING GAVE THE ACTIVATION ENERGY.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 744 744 7/5

CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY

POLYMER PRODUCTION IN THE RADIOLYSIS OF  
MEDICINE, ETHANE, AND ETHYLENE SOLUTIONS IN  
LIQUID ARGON, (U)

MAY 71 6P SHERIDAN, MICHAEL E. ; GREER,  
EDWARD ; LIBBY, W. F. ;  
CONTRACT: AF-AFOSR-1255-67  
PROJ: AF-9538  
MONITOR: AFOSR TR-72-1240

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN THE JNL. OF THE AMERICAN  
CHEMICAL SOCIETY, V94 N8 P2614-2618 1972.

DESCRIPTORS: (\*HYDROCARBONS, \*RADIATION CHEMISTRY),  
ETHYLENES, METHANE, GAMMA RAYS, LIQUEFIED GASES,  
ARGON (U)

IDENTIFIERS: LIQUID ARGON, RADIOLYSIS, IONIZING  
RADIATION (U)

FURTHER STUDIES OF THE PRODUCTS OF RADIOLYSIS OF  
SOLUTIONS OF METHANE, ETHANE, AND ETHYLENE IN LIQUID  
ARGON HAVE BEEN MADE. EARLIER WORK LEFT THE  
QUESTION OF MECHANISM SOMEWHAT UNANSWERED. THE  
ADDITIONAL DATA SEEM TO SHOW THAT THE MOST PROBABLE  
MECHANISM IS IONIZATION OF THE SOLUTES WITH LOWEST  
IONIZATION POTENTIAL BY ELECTRON TRANSFER TO THE  
ARGON IONS INITIALLY PRODUCED BY THE GAMMA RAYS AND  
SUBSEQUENT ION MOLECULE REACTIONS AND NEUTRALIZATION  
TO FORM THE HEAVY HYDROCARBONS. THE LIMIT ON  
MOLECULAR WEIGHT IS SUGGESTED TO BE AN ENERGETIC ONE  
IN WHICH FURTHER GROWTH OF THE POLYMER ION IS  
ENERGETICALLY FORBIDDEN. CHARGE-TRANSFER RECHARGES  
THE POLYMER WHEN IT IS NEUTRALIZED AND THIS IS  
THOUGHT TO HAPPEN SEVERAL TIMES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 746 586 7/5  
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

ENERGY LEVEL STRUCTURE OF TRAPPED ELECTRONS  
IN METHYLTETRAHYDROFURAN GLASS FROM  
PHOTOCONDUCTIVITY AND OPTICAL BLEACHING  
STUDIES,

(U)

JAN 72 11P HUANG, TIMOTHY ; EISELE, IGNATZ  
; LIN, D. P. ; KEVAN, LARRY ;  
CONTRACT: AF-AFOSR-1852-70, AT(11-1)-2086  
MONITOR: AFOSR TR-72-1429

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN THE JNL. OF CHEMICAL  
PHYSICS, V56 N9 P4702-4710, 1 MAY 72.

DESCRIPTORS: (\*FURANS, \*RADIATION CHEMISTRY), ELECTRONS,  
ORGANIC SOLVENTS, MOLECULAR ORBITALS, ELECTRON  
TRANSITIONS, RADIATION CHEMISTRY, PHOTOCONDUCTIVITY,  
PARAMAGNETIC RESONANCE, EXCITATION, CRYOGENICS (U)  
IDENTIFIERS: \*MATRIX ISOLATION TECHNIQUES, \*TRAPPED  
ELECTRONS, ELECTRON PARAMAGNETIC RESONANCE (U)

ELECTRONS ARE TRAPPED IN GAMMA-IRRADIATED  
METHYLTETRAHYDROFURAN (MTHF) GLASS AT 77K.  
MONOCHROMATIC PHOTOEXCITATION PRODUCES  
PHOTOCONDUCTIVITY AND OPTICAL BLEACHING WITH A  
THRESHOLD NEAR 780 NM (1.6 EV) AND A PEAK NEAR  
520 NM (2.4 EV). THIS TRANSITION IS LINEAR IN  
LIGHT INTENSITY AND INDEPENDENT OF TEMPERATURE  
BETWEEN 77 AND 4.2K, SO IT IS INTERPRETED AS A ONE  
PHOTON TRANSITION DIRECTLY TO THE CONDUCTION BAND OR  
TO AN AUTOIONIZING STATE. EFFECTIVE DOUBLE BEAM  
PHOTOEXCITATION DISCLOSES A TWO PHOTON TRANSITION  
WHICH DEPENDS ON THE LIGHT INTENSITY SQUARED. THE  
DEDUCED ENERGY LEVEL STRUCTURE AGREES WELL WITH  
THEORETICAL CALCULATIONS BASED ON A SEMICONTINUUM  
MODEL FOR TRAPPED ELECTRONS IN GLASSY MATRICES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 749 566 7/5

WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

MATRIX (ELECTRON NUCLEAR RESONANCE) ENDOR  
LINEWIDTHS OF TRAPPED ELECTRONS IN GLASSY  
MATRICES AT 77 K,

(U)

FEB 72 9P

HELBERT, JOHN ; KEVAN, LARRY ;

BALES, BARNEY L. ;

CONTRACT: AF-AFOSR-1852-70, AT(11-1)-2086

PROJ: AF-9750, DA-2-0-061102-B-13-B

TASK: 975002

MONITOR: AFOSR, AROL

TR-72-1905, 9999.1-C

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF CHEMICAL  
PHYSICS, V57 N2 P723-729, 15 JUL 72.

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH SAN  
FERNANDO VALLEY STATE COLL., NORTHRIDGE, CALIF.  
DEPT. OF PHYSICS.

DESCRIPTORS: (\*CARBINOLS, \*RADIATION CHEMISTRY),  
(\*FURANS, RADIATION CHEMISTRY), MATRICES (MATHEMATICS),  
BAND THEORY OF SOLIDS, WAVE FUNCTIONS, ELECTRONS,  
ELECTRON PARAMAGNETIC RESONANCE, THEORY, CRYOGENICS (U)

IDENTIFIERS: TETRAHYDROFURAN/2-METHYL, \*TRAPPED  
ELECTRONS, \*ELECTRON NUCLEAR DOUBLE RESONANCE,  
ELECTRON PARAMAGNETIC RESONANCE (U)

MATRIX ENDOR LINES OF PROTONS ASSOCIATED WITH  
TRAPPED ELECTRONS IN GAMMA-IRRADIATED GLASSY MATRICES  
OF 10M NaOH, METHANOL AND 2-METHYLTETRAHYDROFURAN  
AT 77K HAVE BEEN OBSERVED. BY ANALYSIS OF THE  
MATRIX ENDOR LINE SHAPES UNDER COMPARABLE  
EXPERIMENTAL CONDITIONS THE LINewidth HAS BEEN  
RELATED TO THE SPATIAL EXTENT OF THE GROUND STATE  
WAVEFUNCTION OF THE TRAPPED ELECTRON. THESE  
EXPERIMENTAL RESULTS ARE COMPARED WITH PREDICTION OF  
THE SEMICONTINUUM MODEL FOR TRAPPED ELECTRONS AND  
FOUND TO BE IN GOOD AGREEMENT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 749 567 7/5  
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

APPLICATION OF THE SEMICONTINUUM MODEL TO THE  
EFFECT OF DIPOLE REORIENTATION ON TRAPPED  
ELECTRON SPECTRA IN GLASSY ETHANOL, (U)

JAN 72 9P FUEKI, KENJI ; FENG, DA FEI ;  
KEVAN, LARRY ;  
CONTRACT: AF-AFOSR-1852-70, AT(11-1)-2086  
PROJ: AF-9750  
TASK: 975002  
MONITOR: AFOSR TR-72-1906

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF CHEMICAL  
PHYSICS, V56 N11 P5351-5357, 1 JUN 72.

DESCRIPTORS: (\*ETHANOLS, \*RADIATION CHEMISTRY),  
ELECTRONS, ORGANIC SOLVENTS, DIPOLE MOMENTS, MOLECULAR  
ORBITALS, CRYOGENICS, EXCITATION (U)  
IDENTIFIERS: MATRIX ISOLATION TECHNIQUES, \*TRAPPED  
ELECTRONS (U)

A SEMICONTINUUM MODEL IS APPLIED TO TRAPPED  
ELECTRONS IN GLASSY ETHANOL AT 77K. THE  
CONFIGURATIONAL STABILITY OF THE GROUND STATE HAS  
BEEN ESTABLISHED. GROUND, EXCITED, AND CONTINUUM  
STATES ARE CALCULATED SELF-CONSISTENTLY FOR SPECIFIED  
ORIENTATIONS FROM 80 TO 0 DEG. OF THE MOLECULAR  
DIPOLES WITH RESPECT TO THE TRAPPED ELECTRON. IT IS  
SHOWN THAT THE SPECTRAL SHIFTS OBSERVED FOR TRAPPED  
ELECTRONS IN PULSE RADIOLYSIS EXPERIMENTS ON ALCOHOL  
GLASSES AND THE SHIFTS OBSERVED UPON WARMING FROM 4  
TO 77K AFTER GAMMA IRRADIATION AT 4K CAN BE  
SEMIQUANTITATIVELY ACCOUNTED FOR BY THE MOLECULAR  
DIPOLE ORIENTATION MECHANISM. THE EFFECT OF DIPOLE  
ORIENTATION UPON OTHER PHYSICAL PROPERTIES OF THE  
TRAPPED ELECTRONS IN ETHANOL IS ALSO DISCUSSED.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 751 324 7/5  
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)

PULSE RADIOLYSIS OF PENICILLAMINE IN AQUEOUS  
SOLUTION: THE THIYL RADICAL AND THE  
DISULPHIDE RADICAL ANION, (U)

JUN 71 4P PURDIE, J. W. ; GILLIS, H.  
A. ; KLASSEN, N. V. ;  
MONITOR: DREO 645

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN CHEMICAL COMMUNICATIONS,  
P1163-1165 1971. (COM. 1059).

DESCRIPTORS: (\*ORGANIC SULFUR COMPOUNDS, \*FREE  
RADICALS), (\*RADIATION CHEMISTRY, ORGANIC SULFUR  
COMPOUNDS), ELECTRON IRRADIATION, ULTRAVIOLET SPECTRA,  
VISIBLE SPECTRA, IONS, AMINES, AMINO ACIDS, REACTION  
KINETICS, PH FACTOR, CANADA, SOLUTIONS(MIXTURES),  
ABSORPTION SPECTRA (U)  
IDENTIFIERS: MERCAPTANS, MOLECULAR IONS, \*ORGANIC  
SULFIDES, \*PENICILLAMINE, \*PULSE RADIOLYSIS, \*ION  
RADICALS, DISULFIDE ORGANIC COMPOUNDS (U)

IT HAS BEEN SHOWN THAT THE THIYL RADICALS PRODUCED  
BY PULSE RADIOLYSIS OF AQUEOUS SOLUTIONS OF  
MERCAPTANS COMBINE WITH THE SULPHYDRYL ANION TO GIVE  
A RADICAL ANION COMPLEX.  $RS \text{ RADICAL} + RS(-) =$   
 $RSSR(-)$ . THE SAME TRANSIENT HAS BEEN PRODUCED  
FROM DISULPHIDES BY ADDITION OF SOLVATED ELECTRONS:  
 $RSSR + E(-)(AQ) \text{ GOES TO } RSSR(-)$ . IN  
BOTH CASES THE THIYL RADICALS EVENTUALLY COMBINE TO  
GIVE DISULPHIDE:  $RS \text{ RADICAL} + RS \text{ RADICAL GOES}$   
TO  $RSSR$ . THE AUTHORS HAVE INVESTIGATED THE  
TRANSIENTS PRODUCED BY PULSE RADIOLYSIS OF  
PENICILLAMINE,  $H_2CCH(NH_2)C(CH_3)_2SH$ , IN  
AQUEOUS SOLUTIONS AND HAVE OBSERVED BOTH THE  $RS$   
RADICAL AND THE  $RSSR(-)$  RADICAL ANION DIRECTLY.  
SPECTRA WERE MEASURED WITH A SPLIT LIGHT-BEAM  
SYSTEM AND ARE DISCUSSED HERE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 751 328 7/5 6/18 6/1  
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV  
OF BIOLOGY

INVESTIGATION OF CHAIN REACTIONS AND OXYGEN  
EFFECTS DURING RADIOLYSIS OF PEPTIDE  
DISULFIDE BONDS USING CYSTEINE-GLUTATHIONE  
DISULFIDE AS A MODEL,

(U)

JUN 71 11P PURDIE, J. W. ;  
MONITOR: DREO 647

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN RADIATION RESEARCH, V48 N3  
P474-483 DEC 71.

DESCRIPTORS: (\*ORGANIC SULFUR COMPOUNDS, \*RADIATION  
CHEMISTRY), (\*FREE RADICALS, ORGANIC SULFUR COMPOUNDS),  
GLUTATHIONE, AMINO ACIDS, OXYGEN, GAMMA RAYS, DIFFUSION,  
SOLUTIONS(MIXTURES), REACTION KINETICS, CANADA,  
RADIOBIOLOGY, PEPTIDES

(U)

IDENTIFIERS: MOLECULAR IONS, ORGANIC SULFIDES, CHAIN  
REACTIONS, RADIOLYSIS, CYSTEINE, DISULFIDE ORGANIC  
COMPOUNDS

(U)

GAMMA-RADIOLYSIS OF CYSTEINE-GLUTATHIONE DISULFIDE,  
THE MIXED DISULFIDE OF CYSTEINE AND THE TRIPEPTIDE  
GLUTATHIONE, HAS BEEN EXAMINED IN UNBUFFERED AQUEOUS  
SOLUTIONS (0.3 MM). IN THE PRESENCE OF AIR THE  
PRINCIPAL PRODUCTS ARE SULFINIC AND SULFONIC ACIDS OF  
CYSTEINE AND GLUTATHIONE AND THE SYMMETRICAL  
DISULFIDES, CYSTINE AND GLUTATHIONE DISULFIDE. IN  
THE ABSENCE OF AIR, CYSTEINE, GLUTATHIONE, AND THE  
SULFINIC ACID DERIVATIVES OF THESE THIOLS WERE  
PRODUCED. IRRADIATION OF SOLUTIONS CONTAINING  
VARIOUS CONCENTRATIONS OF MIXED DISULFIDE AND A RANGE  
OF SYMMETRICAL DISULFIDES SHOWED THAT THE HIGH YIELDS  
OF SYMMETRICAL DISULFIDES WERE DUE TO A CHAIN  
REACTION WHICH COULD BE SUPPRESSED BY OXYGEN.  
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 751 481 7/5 11/9  
STANFORD RESEARCH INST MENLO PARK CALIF

AGING AND DEGRADATION OF POLYOLEFINS. II.  
GAMMA-INITIATED OXIDATIONS OF ATACTIC  
POLYPROPYLENE. (U)

DESCRIPTIVE NOTE: REPT. NO. 11 (FINAL), 1 MAY 71-31  
AUG 72,

AUG 72 46P DECKER, CHRISTIAN ; MAYO, FRANK

R. ;

CONTRACT: DAHC04-72-C-0007  
PROJ: SRI-8012-1, SRI-8012-2  
MONITOR: AROD 8255:5-C

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-751 482 AND AD-751  
480. ALSO INCLUDES REPT. NO. 9.

DESCRIPTORS: (\*POLYMERS, \*DECOMPOSITION), (\*OXIDATION,  
POLYMERS), (\*RADIATION CHEMISTRY, POLYMERS), GAMMA RAYS,  
FREE RADICALS, REACTION KINETICS, ALCOHOLS, KETONES,  
PEROXIDES (U)

IDENTIFIERS: \*OLEFINS, \*ATACTIC POLYMERS, CAGE  
EFFECT(CHEMISTRY), CHEMICAL REACTION MECHANISMS,  
\*POLYPROPYLENE (U)

THE STUDY PRESENTS THE RATES AND PRODUCTS OF  
OXIDATION OF AMORPHOUS POLYPROPYLENE (PP) AS  
INITIATED BY THE ACTION OF GAMMA RAYS, FOR COMPARISON  
WITH THE DI-T-BUTYLPEROXY OXALATE (DBPO)-INITIATED  
OXIDATIONS OF PP AND WITH THE GAMMA-INITIATED  
OXIDATIONS OF POLYETHYLENE AND ETHYLENE-PROPYLENE  
COPOLYMERS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 751 482 7/5 11/9  
STANFORD RESEARCH INST MENLO PARK CALIF

AGING AND DEGRADATION OF POLYOLEFINS. III.  
POLYETHYLENE AND ETHYLENE-PROPYLENE  
COPOLYMERS.

(U)

DESCRIPTIVE NOTE: REPT. NO. 10 (FINAL), DEC 70-31  
AUG 72,  
AUG 72 29P DECKER, CHRISTIAN ; MAYO, FRANK  
R. ; RICHARDSON, HAROLD ;  
CONTRACT: DAHC04-72-C-0007  
PROJ: SRI-8012-2  
MONITOR: AROD 8255:7-C

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-751 483 AND AD-751  
481.

DESCRIPTORS: (\*POLYMERS, \*DECOMPOSITION), (\*OXIDATION,  
POLYMERS), (\*RADIATION CHEMISTRY, POLYMERS),  
(\*POLYETHYLENE PLASTICS, OXIDATION), MOLECULAR  
STRUCTURE, REACTION KINETICS, GAMMA RAYS, ALCOHOLS,  
KETONES, MOLECULAR STRUCTURE (U)  
IDENTIFIERS: \*OLEFIN RESINS, \*POLYPROPYLENE, \*ETHYLENE  
PROPYLENE COPOLYMERS (U)

REPORTED IS A COMPARISON OF THE EFFECTS OF CHANGES  
IN STRUCTURE AND DEGREE OF CRYSTALLINITY ON  
OXIDATIONS OF POLYETHYLENE (PE), ETHYLENE-PROPYLENE  
COPOLYMERS (EP), AND POLYPROPYLENE (PP) AT THE  
SAME RATES OF GAMMA-INITIATION AT 45C. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 752 645 7/5  
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

THERMALLY STIMULATED CONDUCTIVITY OF GAMMA-  
IRRADIATED TRIETHYLAMINE AND 3-METHYLPENTANE  
GLASSES, (U)

JAN 72 6P MUNJAL, ASHOK K. ; KEVAN,  
LARRY ;  
CONTRACT: AF-AFOSR-1852-70, AT(11-1)-2086  
PROJ: AF-9750  
TASK: 975002  
MONITOR: AFOSR TR-72-2267

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF PHYSICAL  
CHEMISTRY, V76 P2781 1972.

DESCRIPTORS: (\*RADIATION CHEMISTRY, THERMAL  
CONDUCTIVITY), (\*AMINES, RADIATION CHEMISTRY),  
ELECTRONS, CRYOGENICS, ELECTRICAL CONDUCTIVITY (U)  
IDENTIFIERS: MATRIX ISOLATION TECHNIQUES, RADIOLYSIS,  
\*TRAPPED ELECTRONS, TRIETHYLAMINE (U)

THERMALLY STIMULATED CONDUCTIVITY OF 60CO GAMMA-  
IRRADIATED AND UNIRRADIATED TRIETHYLAMINE WAS STUDIED  
AS THE GLASSY MATRIX WAS WARMED FROM 77K. THE  
UNIRRADIATED MATRIX GIVES A PEAK NEAR 117K WHICH  
CAN BE REMOVED BY FIELD ORIENTATION UPON FREEZING THE  
MATRIX. THE IRRADIATED MATRIX GIVES EVIDENCE FOR  
THREE DIFFERENT TYPES OF RADIATION-PRODUCED SPECIES  
AS INDICATED BY CONDUCTIVITY PEAKS IN DIFFERENT  
TEMPERATURE RANGES. A FEW EXPERIMENTS WERE ALSO  
CARRIED OUT ON GLASSY 3-METHYLPENTANE TO COMPARE WITH  
TWO PUBLISHED STUDIES OF THERMALLY STIMULATED  
CONDUCTIVITY IN THIS MATRIX WHICH ARE DIVERGENT.  
OUR RESULTS CONFIRM THOSE OF WISEALL AND  
WILLARD. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 753 652 7/5  
NEWCASTLE-UPON-TYNE UNIV (ENGLAND) DEPT OF ORGANIC  
CHEMISTRY

GAMMA-RADIOLYSIS OF TERTIARY AROMATIC  
AMINES.

(U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 OCT 71-30  
SEP 72,

OCT 72 14P KHANDLWAL, G. D. ; SWAN, G.

A. ;

CONTRACT: DAJA37-72-C-1546

PROJ: DA-2-0-061102-B-13-B

MONITOR: ARDG(E) E-1371

UNCLASSIFIED REPORT

DESCRIPTORS: (\*AMINES, \*RADIATION CHEMISTRY), (\*NITROGEN  
HETEROCYCLIC COMPOUNDS, RADIATION CHEMISTRY), GAMMA  
RAYS, FREE RADICALS, PIPERIDINES, GREAT BRITAIN (U)  
IDENTIFIERS: AZEPINES, \*RADIOLYSIS (U)

EARLIER RESEARCH ON THE GAMMA-RADIOLYSIS OF 1-  
PHENYLPYRROLIDINE HAS BEEN EXTENDED TO GIVE EVIDENCE  
OF THE FORMATION OF THE ENAMINE 1-PHENYL-2-  
PYRROLIDINE AS AN INTERMEDIATE. THUS, IRRADIATION  
OF THE AMINE IN THE PRESENCE OF N-PHENYLMALIMIDE  
YIELDS 1,2,3,4,5,6-HEXAHYDRO-4AH-BENZO  
(C)QUINOLIZINE-5-6-N-PHENYLDICARBOXIMIDE; BUT  
IF THE AMINE IS FIRST IRRADIATED IN THE PURE STATE,  
AND SUBSEQUENTLY TREATED WITH N-PHENYLMALIMIDE, AN  
ISOMERIC PRODUCT IS OBTAINED. GAMMA-RADIOLYSIS OF,  
OR REACTION OF T-BUTOXY RADICALS WITH 1-  
PHENYLHEXAHYDROAZEPINE YIELDS THE RADICAL COUPLING  
DIMER 1,1'DIPHENYLDODECAHYDRO-2,2'-BIAZEPINE. A  
NUMBER OF 2-ARYLHEXAHYDROISOINDOLINES AND 2-P-  
TOLYLOCTAHYDROCYCLOPENTA (C)PYRROLE WERE ALSO  
PREPARED. REACTION OF COMPOUNDS WITH T-BUTOXY  
RADICALS AFFORDED DIMERIC PRODUCTS ANALOGOUS TO ONE  
OBTAINED FROM 1-PHENYLPYRROLIDINE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 753 917 7/5 18/8  
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J

SPECTRAL IDENTIFICATION OF COMPOUNDS FORMED  
BY NUCLEAR RADIATION IN AIR FOR REMOTE  
FALLOUT SURVEY. (U)

DESCRIPTIVE NOTE: RESEARCH AND DEVELOPMENT TECHNICAL  
REPT.,

NOV 72 22P HARMATZ, MILTON ;  
REPT. NO. ECOM-4053  
PROJ: DA-1-T-061102-B-11-A  
TASK: 1-T-061102-B-11-A-01

UNCLASSIFIED REPORT

DESCRIPTORS: (\*RADIATION CHEMISTRY, \*AIR), (\*NITROGEN  
OXIDES, RADIATION CHEMISTRY), INFRARED SPECTRA, ALPHA  
PARTICLES, FALLOUT, POLONIUM, COBALT (U)  
IDENTIFIERS: NITROGEN OXIDE(N2O), NITROGEN OXIDE(NO2),  
COBALT 60, POLONIUM 210, IONIZING RADIATION (U)

MEASUREMENTS OF THE NITROGEN COMPOUND FORMATION  
PRODUCED BY IONIZING IRRADIATION ON AIR AT 300K AND  
760 MMHG ARE REPORTED. INFRARED  
SPECTROPHOTOMETRY MEASUREMENTS OF DRY AIR EXPOSED TO  
0.230 CURIE POLONIUM-210 SHOWED THAT NITROUS OXIDE  
AND NITROGEN PENTOXIDE WERE THE INITIAL PRODUCT  
FORMED. THERE WERE INDICATIONS THAT THE  
DECOMPOSITION OF THE NITROGEN PENTOXIDE FOLLOWING 25  
HOURS OF EXPOSURE ENHANCED THE GROWTH OF NITROGEN  
DIOXIDE. THROUGHOUT THE IRRADIATION PERIOD, NITROUS  
OXIDE WAS A MAJOR AND THE MOST STABLE CONSTITUENT  
PEAK. INFRARED SPECTRA OF AIR EXPOSED TO LOWER  
ACTIVITY VALUES 0.115 AND 0.050 CURIE ALSO EXHIBITED  
NITROUS OXIDE AS A DOMINANT CONSTITUENT. THE  
RESULTS OBTAINED FROM IRRADIATING AIR WITH THE THREE  
ALPHA PARTICLE SOURCES INDICATED THAT THE FORMATION  
OF NITROUS OXIDE AND NITROGEN DIOXIDE WAS DOSE RATE  
DEPENDENT. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 754 145 6/1  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER CHARLOTTESVILLE  
VA

INVESTIGATION OF THE PARAMAGNETIC CENTERS OF  
THE IRRADIATED PROTEINS, (U)

NOV 72 243P KAYUSHIN, L. P. ; LVOV, K.  
M. ; PULATOVA, M. K. ;  
REPT. NO. FSTC-HT-23-324-71  
PROJ: FSTC-T7023012301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF MONO. PRIRODA  
PARAMAGNITNYKH TSENTROV V Y-OBLUCHENNOM GLITSINE,  
MOSCOW, 1970 239P.

DESCRIPTORS: (\*PROTEINS, \*RADIATION CHEMISTRY),  
(\*PARAMAGNETIC RESONANCE, PROTEINS), FREE RADICALS,  
AMINO ACIDS, PEPTIDES, GAMMA RAYS, GLYCINE, MOLECULAR  
STRUCTURE, IONIZATION, HARTREE-FOCK APPROXIMATION,  
MOLECULAR ORBITALS, CHEMICAL BONDS, MOLECULAR  
ASSOCIATION, USSR (U)  
IDENTIFIERS: IONIZING RADIATION, TRANSLATIONS (U)

EXPERIMENTAL DATA ON PARAMAGNETIC CENTERS OCCURRING  
IN BIOLOGICALLY IMPORTANT COMPOUNDS AS A RESULT OF  
RADIATION ARE SYSTEMATIZED. MUCH OF THE REPORT IS  
DEVOTED TO ANALYSIS OF THE ELECTRON PARAMAGNETIC  
RESONANCE SPECTRA OF FREE RADICALS FORMED BY GAMMA-  
RAYS IN AMINO ACIDS AND PEPTIDES. THE RESULTS OF  
INVESTIGATION OF THE PARAMAGNETIC RESONANCE OF  
RADIATION DISRUPTIONS IN PROTEINS ARE PRESENTED.  
ANALYSIS OF THE PARAMAGNETIC CENTERS OF IRRADIATED  
BIOPOLYMERS OF DIFFERENT SPATIAL STRUCTURE AND UNDER  
DIFFERENT PHYSICAL CONDITIONS MADE IT POSSIBLE IN  
MANY CASES TO TRACE THE PATH BY WHICH THE TRANSFER  
AND EXCHANGE OF ENERGY OF ABSORBED RADIATION PROCEED  
IN MOLECULES OF BIOLOGICAL SYSTEMS, AND TO OBTAIN  
INFORMATION ON THE UNIQUE STRUCTURE OF BIOPOLYMERS.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 760 233 7/5  
BRITISH COLUMBIA UNIV VANCOUVER DEPT OF CHEMISTRY

NANOSECOND PULSE RADIOLYSIS TECHNIQUES FOR  
THE STUDY OF LIQUIDS USING A 600 KV  
FEBETRON,

(U)

SEP 71 18P KENNEY-WALLACE, G. A. ;  
SHAEDA, E. A. ; WALKER, D. C. ; WALLACE, S. C.  
;

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN INTERNATIONAL JNL.  
RADIATION PHYSICS AND CHEMISTRY.

SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 5 JUL  
71.

DESCRIPTORS: (\*RADIATION CHEMISTRY, \*ELECTRON  
ACCELERATORS), LIQUIDS, FLUORESCENCE, ADSORPTION,  
REACTION KINETICS, LABORATORY EQUIPMENT, DESIGN, CANA(U)  
IDENTIFIERS: \*RADIOLYSIS (U)

SOME OF THE WAYS IN WHICH A 600 KV FEBETRON  
ELECTRON ACCELERATOR HAS BEEN ADAPTED TO NANOSECOND  
PULSE RADIOLYSIS STUDIES OF LIQUIDS ARE OUTLINED  
UNDER FOUR CATEGORIES: (1) EMISSION  
SPECTROSCOPY DURING THE PULSE AND WHEN THE MEDIUM  
SHOWS STRONG SELF-ABSORPTION OF ITS OWN FLUORESCENCE,  
(2) INSTANTANEOUS ABSORPTION SPECTROSCOPY USING  
AN INTERNAL CERENKOV LIGHT SOURCE; THIS HAS BEEN  
DEMONSTRATED BY SPECTROGRAPHIC AND SPECTROPHOTOMETRIC  
METHODS AND THE SENSITIVITY IS SUCH THAT STRONGLY  
ABSORBING SPECIES HAVING LIFETIMES AS SHORT AS  $3 \times 10^{-11}$   
SECONDS MAY BE DETECTED, (3) VERY  
FAST KINETIC STUDIES USING LASER PHOTOMETRY FOR  
MONITORING PURPOSES AND USING THE MAXIMUM DOSE RATES,  
(4) A COMBINED FLASH PHOTOLYSIS-PULSE RADIOLYSIS  
ARRANGEMENT IN WHICH PART OF THE ELECTRON BEAM IS  
USED FOR RADIOLYSIS AND THE REST TO STIMULATE A  
NANOSECOND LIGHT FLASH IN A SILVERED HEMISPHERICAL  
SCINTILLATOR SURROUNDING THE IRRADIATION CELL.  
ADVANTAGES OF THE VERY INTENSE AND SHORT ELECTRON  
PULSE ARE DISCUSSED TOGETHER WITH THE PROBLEMS  
ASSOCIATED WITH WEAK PENETRATION OF 600 KV  
ELECTRONS. SOME EXPERIMENTAL DETAILS ARE GIVEN  
INCLUDING METHODS OF DOSIMETRY. (MODIFIED AUTHOR  
ABSTRACT)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 763 492 7/5  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER CHARLOTTESVILLE  
VA

RADIOLYSIS OF CRYSTALLINE AZIDES, BROMATES  
AND NITRATES (RADIOLIZ KRISTALLICHESKIKH  
AZIDOV, BROMATOV I NITRATOV), (U)

JAN 73 20P BOLDYREV, V. V. ;  
REPT. NO. FSTC-HT-23-445-73  
PROJ: FSTC-T7023012301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF INTERNATIONAL JNL. FOR  
RADIATION PHYSICS AND CHEMISTRY (ENGLAND) V3 N2  
P155-169 1971.

DESCRIPTORS: (\*AZIDES, RADIATION CHEMISTRY), (\*NITRATES,  
RADIATION CHEMISTRY), (\*ALKALI METAL COMPOUNDS,  
\*RADIATION CHEMISTRY), THERMAL STABILITY, BROMINE  
COMPOUNDS, REACTION KINETICS, SALTS, USSR (U)  
IDENTIFIERS: \*BROMATES, RADIOLYSIS, TRANSLATIONS (U)

RADIATION STABILITY OF CRYSTALLINE AZIDES, BROMATES  
AND NITRATES OF ALKALI METALS AT ROOM TEMPERATURE HAS  
BEEN COMPARED WITH THEIR THERMAL STABILITY. THE  
OBSERVED CHANGE IN RADIATION YIELD IS EXPLAINED BY  
CONSIDERING A RELATION BETWEEN RADIATION FRAGMENT AND  
FREE VOLUME. THE NECESSITY OF SEARCH FOR NEW WAYS  
OF USING RADIATION FOR SOLVING APPLIED PROBLEMS, ON  
ONE HAND, AND THE NECESSITY OF SEARCH FOR METHODS OF  
RAISING RADIATION STABILITY OF MATERIALS, USED IN  
VARIOUS BRANCHES OF SCIENCE AND TECHNOLOGY, ON THE  
OTHER HAND, ARE THE CAUSES LEADING TO INCREASING  
INTEREST OF MANY RESEARCH WORKERS IN THE STUDY OF  
RADIATION-CHEMICAL PROCESSES IN SOLID BODIES AND  
THEIR PHYSICO-CHEMICAL PROPERTIES CAUSED BY  
IRRADIATION. THE BASIC RESULTS OBTAINED DURING  
MANY YEARS OF RESEARCH IN OUR LABORATORY IN THIS  
DIRECTION, IS PRESENTED IN THIS ARTICLE.

(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 776 827 7/5  
CALIFORNIA INST OF TECH PASADENA GATES AND CRELLIN LABS  
OF CHEMISTRY

EXCITED STATE FORMATION IN THE IRRADIATION OF  
1, 3-CYCLOHEXADIENE, (U)

71 13P PENNER, THOMAS L. ; HAMMOND,  
GEORGE S. ;  
REPT. NO. CONTRIB-4094  
CONTRACT: AF-49(638)-1479  
PROJ: AF-9538  
MONITOR: AFOSR TR-74-0395

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN ORGANIC SCINTILLATORS AND  
LIQUID SCINTILLATION COUNTING, P327-337 1971.

DESCRIPTORS: \*RADIATION CHEMISTRY, IRRADIATION,  
EXCITATION, DIMERS, CYCLOHEXENES, MOLECULAR  
ENERGY LEVELS, GAMMA RAYS, REACTION KINETICS,  
ENERGY TRANSFER (U)

IDENTIFIERS: \*CYCLOHEXADIENE COMPOUNDS,  
\*DIMERIZATION, CHEMICAL REACTION MECHANISMS (U)

IRRADIATION OF 1,3-CYCLOHEXADIENE WITH HIGH ENERGY  
RADIATION LEADS TO DIMERIZATION. RELATIVE AMOUNTS  
OF THESE DIMERS VARY WIDELY WITH REACTION CONDITIONS  
BUT THE COMPOSITION OF THE MIXTURES CAN BE EXPRESSED  
IN TERMS OF VARIABLE AMOUNTS OF TWO GROUPS EACH OF  
WHICH CONTAINS THE DIMERS IN A FIXED PROPORTION.  
THE EVIDENCE INDICATES THAT ONE OF THESE GROUPS  
ARISES FROM DIMERIZATION OF THE CYCLOHEXADIENE CATION  
AND THAT THE OTHER ORIGINATES FROM DIENE TRIPLETS.  
THE LATTER IN TURN APPEAR TO BE PRODUCED BY  
NEUTRALIZATION OF IONS. SINGLET PRODUCT, 1, 3, 5-  
HEXATRIENE, IS ALSO FORMED BUT IS NOT IONIC IN  
ORIGIN. THE EFFECT OF A CHANGE IN LINEAR ENERGY  
TRANSFER ON THE RADIATION PROCESSES IS ALSO  
INVESTIGATED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZUM07

AD- 779 632 7/5 7/3  
STANFORD RESEARCH INST MENLO PARK CALIF

AGING AND DEGRADATION OF POLYOLEFINS. III.  
POLYETHYLENE AND ETHYLENE-PROPYLENE  
COPOLYMERS,

(U)

JUN 73 22P DECKER, CHRISTIAN ; MAYO, FRANK  
R. ; RICHARDSON, HAROLD ;  
CONTRACT: DAHC04-72-C-0007  
MONITOR: AROD 8255.10-C

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF POLYMER  
SCIENCE: POLYMER CHEMISTRY EDITION, V11 P2879-2898  
1973.

SUPPLEMENTARY NOTE: SEE ALSO AD-751 482 AND AD-779  
633.

DESCRIPTORS: \*POLYETHYLENE, \*POLYPROPYLENE,  
\*OXIDATION, \*RADIATION CHEMISTRY, GAMMA RAYS,  
REACTION KINETICS, THIN FILMS, FREE RADICALS  
IDENTIFIERS: COPOLYMERS, OLEFIN RESINS

(U)

(U)

RATES OF OXYGEN ABSORPTION AND FORMATION OF  
OXIDATION PRODUCTS WERE DETERMINED IN GAMMA-INITIATED  
OXIDATIONS OF THIN FILMS OF HIGH- AND LOW-DENSITY  
POLYETHYLENE, ATACTIC AND ISOTACTIC POLYPROPYLENE,  
AND OF THREE ETHYLENE-PROPYLENE COPOLYMERS.  
RADIATION YIELDS G FOR O<sub>2</sub> ABSORBED AND  
FORMATION OF HYDROPEROXIDES DEPEND ON DOSE RATES AND  
DECREASE SHARPLY WITH INCREASING ETHYLENE CONTENT OF  
THE COPOLYMERS AND MODERATELY WITH INCREASING  
CRYSTALLINITY OF ANY BASE POLYMER. G VALUES FOR  
DIALKYL PEROXIDE AND CARBONYL FORMATION, AND  
THEREFORE FOR CHAIN INITIATION AND TERMINATION, DO  
NOT CHANGE MUCH WITH POLYMER COMPOSITION AND  
CRYSTALLINITY AND NOT AT ALL WITH DOSE RATES. A  
FEW EXPERIMENTS WITH ATACTIC POLYPROPYLENE AND AN  
AMORPHOUS ETHYLENE-PROPYLENE COPOLYMER, INITIATED BY  
DI-TERT-BUTYLPEROXY OXALATE, INDICATE THAT 37 MOLE-  
% OF ETHYLENE IN THE POLYMER INCREASES THE  
EFFICIENCY OF INITIATION AND THE TENDENCY TOWARD  
CROSSLINKING. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 780 613 7/5 7/4  
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY

PROPERTIES OF ENERGETIC IONS TRAPPED IN  
SOLIDS OF INTEREST AS FUTURE ENERGY  
SOURCES.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 1 OCT 69-30 SEP 73,  
DEC 73 31P KEVAN, LARRY ;  
CONTRACT: AF-AFOSR-1852-70  
PROJ: AF-9750  
TASK: 975002  
MONITOR: AFOSR TR-74-0800

UNCLASSIFIED REPORT

DESCRIPTORS: \*IONS, \*RADIATION CHEMISTRY, GLASS,  
ELECTRONS, ELECTRON MOBILITY, SCIENTIFIC RESEARCH,  
ABSTRACTS, PHOTOIONIZATION, PHOTOCONDUCTIVITY,  
ICE, MAGNETIC PROPERTIES, ENERGY TRANSFER,  
ELECTRICAL CONDUCTIVITY, ATOMIC ENERGY LEVELS,  
ELECTRON PARAMAGNETIC RESONANCE, CHEMICAL RADICALS,  
RELAXATION, RADIOLYSIS (U)  
IDENTIFIERS: \*MATRIX ISOLATION TECHNIQUES,  
ELECTRON ELECTRON DOUBLE RESONANCE, ELECTRON  
NUCLEAR DOUBLE RESONANCE, \*TRAPPED ELECTRONS,  
TRAPPED PARTICLES (U)

THIS IS A FINAL REPORT OF RESEARCH DESIGNED TO  
EXTEND THE KNOWLEDGE OF PRODUCTION, STORAGE AND  
UTILIZATION OF HIGHLY ENERGETIC CHEMICAL SPECIES.  
THE RESEARCH CONCENTRATED ON THE PHYSICAL AND  
CHEMICAL PROPERTIES OF RADIATION-PRODUCED IONS  
TRAPPED IN SOLID MATRICES. THE FIRST DEFINITIVE AND  
COMPREHENSIVE PICTURE OF TRAPPED ELECTRON ENERGY  
LEVELS IN GLASSY MATRICES EXTENDING OVER A BROAD  
RANGE OF POLARITY HAS BEEN OBTAINED FROM BOTH  
EXPERIMENTAL AND THEORETICAL STUDIES. MOBILITY  
MEASUREMENTS OF ELECTRONS IN CONDUCTION STATES OF  
GLASSY MATRICES HAVE ALLOWED THE IDENTIFICATION OF  
THE DOMINANT ELECTRON SCATTERING MECHANISMS. NEW  
METHODS INVOLVING ELECTRON-ELECTRON DOUBLE RESONANCE  
HAVE BEEN DEVELOPED TO STUDY MAGNETIC ENERGY TRANSFER  
BETWEEN IONS AND RADICALS IN DISORDERED SOLIDS. THE  
SPATIAL CORRELATION BETWEEN CATIONS AND ELECTRONS  
PRODUCED BY PHOTOIONIZATION HAS BEEN DEMONSTRATED TO  
DEPEND UPON THE PHOTOIONIZATION ENERGY. THESE  
STUDIES LAY THE GROUNDWORK FOR CHARACTERIZING THE  
STABILITY OF ION TRAPPING IN DISORDERED SOLIDS.  
INCLUDED ARE ABSTRACTS OF 34 PAPERS COMPLETED ON  
THIS PROJECT. (MODIFIED AUTHOR ABSTRACT) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 785 971 7/4  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER CHARLOTTESVILLE  
VA

USE OF A CYCLOTRON TO STUDY THE RADATION  
CHEMISTRY OF SOLIDS, (U)

OCT 73 9P OBLIVANTSEV, A. N. ; LYKHIN,  
V. M. ; EREMIN, L. P. ;  
REPT. NO. FSTC-HT-23-913-73

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF POLITEKHNICHESKII  
INSTITUT, TOMSK. IZVESTIYA (USSR) V176 P116-121  
1970.

DESCRIPTORS: \*RADIATION CHEMISTRY, \*ALKALI METAL  
COMPOUNDS, \*CYCLOTRONS, IONIZING RADIATION,  
PROTONS, TRANSLATIONS, USSR (U)

DURING THE LAST FIVE YEARS, WORK HAS BEEN PERFORMED  
USING THE CYCLOTRON OF THE SCIENTIFIC RESEARCH  
INSTITUTE OF NUCLEAR PHYSICS AT THE TPI, TO  
STUDY THE RADIO-CHEMICAL STABILITY OF IONIZED  
CRYSTALS UNDER THE ACTION OF A PROTON BEAM ESCAPING  
INTO THE ATMOSPHERE. AS TARGET, AZIDES, NITRATES,  
PERCHLORATES AND PERMANGANATES OF ALKALI METALS WERE  
USED. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 787 531            7/5            7/3            7/4  
RICHMOND COLL STATEN ISLAND N Y

RADIATION EFFECTS IN CROSSLINKING IN  
POLYMERIC SYSTEMS. (U)

DESCRIPTIVE NOTE: REPT. NO. 10, 1 OCT 68-31 JUL 74  
(FINAL),

SEP 74            8P            ODIAN, GEORGE ;  
CONTRACT: DA-ARO(D)-31-124-G1063  
MONITOR: AROD        7923.1-C

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: \*RADIATION CHEMISTRY, SCIENTIFIC  
RESEARCH, REACTION KINETICS, DIFFUSION, FILMS,  
POLYMERIZATION (U)

IDENTIFIERS: \*GRAFT POLYMERIZATION (U)

THE PAPER OUTLINES RESEARCH FINDINGS ON A PROJECT INVOLVING THE ELUCIDATION OF THE PROCESS OF RADIATION-INDUCED GRAFT POLYMERIZATION OF MONOMER TO POLYMER. THE QUANTITATIVE INTERRELATIONSHIPS OF THE INITIATION RATE, THE  $K(P)/(K(+))$  TO THE  $1/2$  (POWER) RATIO FOR THE MONOMER, THE EQUILIBRIUM SOLUBILITY OF THE MONOMER IN THE POLYMER, THE POLYMER FILM THICKNESS, THE REACTION TIME, AND THE DIFFUSIVITY OF THE MONOMER IN THE POLYMER WERE INVESTIGATED. WORK ON THE PROJECT HAS GIVEN A MATHEMATIC ANALYSIS OF THE GRAFTING REACTION AND ITS EXACT DEPENDENCE ON THESE FACTORS. EQUATIONS SHOW QUANTITATIVELY HOW THE VARIOUS PARAMETERS IN ANY GRAFTING SYSTEM INTERACT TO LEAD TO DIFFUSION-CONTROLLED GRAFT POLYMERIZATION. (U)

AD-A047 350

DEFENSE DOCUMENTATION CENTER ALEXANDRIA VA  
RADIATION CHEMISTRY.(U)  
NOV 77

F/G 7/5

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 836 970 7/5 11/9 7/3  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D  
C

RADIATION-INDUCED POLYMERIZATION OF POLYFUNCTIONAL  
VINYL SILOXANE, (U)

68 9P KONOBEVSKII, K. S. ;  
GUSSELNIKOV, L. E. ; NAMETKIN, N. S. ; POLAK, L.  
S. ; CHERNYSHEVA, T. I. ;  
REPT. NO. FSTC-HT-23-273-68  
TASK: 8223627-23.01

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF VYSOKOMOLEKULYARNYE  
SOEDINENIYA (USSR) V8 N3 P553-556 1966, BY GEORGE G.  
WEICKHARDT.

DESCRIPTORS: (\*SILOXANES, POLYMERIZATION),  
(\*POLYMERIZATION, \*RADIATION CHEMISTRY), SILICONE  
PLASTICS, SYNTHESIS (CHEMISTRY), DECOMPOSITION,  
COPOLYMERIZATION, GELS, INFRARED SPECTROSCOPY,  
PARAMAGNETIC RESONANCE, CROSSLINKING (CHEMISTRY), USSR (U)  
IDENTIFIERS: GRAFT COPOLYMERS, RADIOLYSIS,  
TRANSLATIONS (U)

IT WAS PREVIOUSLY DEMONSTRATED THAT POLYFUNCTIONAL  
VINYL SILOXANES WERE POLYMERIZED BY RADIATION, FORMING  
HIGH MOLECULAR POLYMERS. ON EXAMINATION OF THE  
MOLECULAR WEIGHTS AND CHARACTERISTIC VISCOSITIES OF  
THESE POLYMERS THE HYPOTHESIS THAT POLYMER MOLECULES  
ARE SOLUBLE MICROGELS WAS ARRIVED AT. THE PRESENT  
WORK EXAMINES SOME PROPERTIES OF POLYMERIZATION OF  
THESE MONOMERS. THE HYPOTHESES WERE CONFIRMED.  
THE POLYMER IS A SOLUBLE MICROGEL. THE  
POSSIBILITY OF INDUCING POLYMERIZATION OF VINYL  
MONOMERS WITH MICROGELS OF POLYVINYL SILOXANES WAS  
ESTABLISHED, AND RADIOLYSIS AND POLYMERIZATION OF  
POLYFUNCTIONAL VINYL SILOXANES WERE STUDIED.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 842 191 7/5 11/10  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D  
C

STUDY OF RADIATION-INDUCED POLYMERIZATION. PART  
VI: RADIATION-INDUCED POLYMERIZATION OF  
CHLOROPRENE, (U)

68 22P IVANOV, V. S. ; MEDVEDEV, YU.  
V. ; IVANOVA, L. I. ;  
REPT. NO. FSTC-HT-23-209-68  
PROJ: FSTC-82236282301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF LENINGRAD UNIV.  
VESTNIK (USSR) V20 N22 SERIYA FIZIKI I KHIMII, N4  
P154-164 1965.

DESCRIPTORS: (\*CHLOROPRENES, POLYMERIZATION),  
(\*POLYMERIZATION, \*RADIATION CHEMISTRY), GAMMA RAYS,  
DOSE RATE, TEMPERATURE, STABILIZATION, ADDITIVES,  
MOLECULAR WEIGHT, FREE RADICALS, IONS,  
CROSSLINKING(CHEMISTRY), ELASTOMERS, TRANSITION  
TEMPERATURE, USSR (U)  
IDENTIFIERS: CHEMICAL REACTION MECHANISMS, \*RADIATION  
POLYMERIZATION, TRANSLATIONS (U)

THE PURPOSE OF THE WORK WAS THE STUDY OF RADIATION  
POLYMERIZATION OF CHLOROPRENE UNDER CONDITIONS WHICH  
PRESENT SPONTANEOUS POLYMERIZATION AND THE STUDY OF  
THE INFLUENCE OF THE DOSE, DOSE RATE, POLYMERIZATION  
TEMPERATURE, GASEOUS MEDIA, TYPE AND CONCENTRATION OF  
STABILIZERS ON THE YIELD, AVERAGE MOLECULAR WEIGHT,  
AND CERTAIN PROPERTIES OF THE POLYMERS. THE  
RADIATION POLYMERIZATION OF CHLOROPRENE TAKES PLACE  
AT +20C BY A FREE-RADICAL MECHANISM. AN IONIC  
MECHANISM BEGINS TO TAKE PLACE AS THE TEMPERATURE  
DROPS BELOW 20C. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD- 850 946 7/5  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D  
C

PRIMARY PRODUCTS OF THE RADIOLYSIS OF WATER  
AND THEIR REACTIVITY, (U)

68 56P PIKAEV, A. K. ;ERSHOV, B.  
G. I  
REPT. NO. FSTC-HT-23-136-68  
PROJ: FSTC-92236282301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF USPEKHI KHIMII (USSR)  
V36 N8 P1427-1459 1967.

DESCRIPTORS: (\*WATER, \*RADIATION CHEMISTRY), (\*HEAVY  
WATER, RADIATION CHEMISTRY), REACTION KINETICS,  
HYDROXIDES, FREE RADICALS, HYDROGEN, HYDROGEN PEROXIDE,  
DECOMPOSITION, USSR (U)  
IDENTIFIERS: \*RADIOLYSIS, ELECTRONS, SOLVATES,  
TRANSLATIONS (U)

THE RADIOLYTIC CONVERSIONS IN AQUEOUS SOLUTIONS  
RESULTING FROM REACTIONS OF DISSOLVED SUBSTANCES WITH  
THE RADIOLYSIS PRODUCTS OF WATER ARE DISCUSSED.  
RESEARCH ON THE PHYSICAL AND CHEMICAL PROCESSES OF  
HYDRATION IS OUTLINED AND ILLUSTRATED BY EXPERIMENTATIONS  
ON HYDRATED ELECTRONS, OH AND HO2 RADICALS.  
KINETICS OF EXCITED WATER, H2 AND H2O2  
MOLECULAR PRODUCTS AND MAXIMUM YIELDS FROM WATER  
DECOMPOSITION. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD-A008 148 7/5 6/1 6/18  
ARMED FORCES RADIOBIOLOGY RESEARCH INST BETHESDA MD

FREE RADICAL-INDUCED CHAIN BREAKAGE IN  
IRRADIATED AQUEOUS SOLUTIONS OF DNA, (U)

MAR 74 21P MEABURN, G. M. ; COLE, C.  
M. ;  
REPT. NO. AFRI-SR74-3  
PROJ: DNA-NWED-QAXM  
TASK: C907

UNCLASSIFIED REPORT

DESCRIPTORS: \*DEOXYRIBONUCLEIC ACIDS, \*RADIATION  
EFFECTS, \*RADIATION CHEMISTRY, HYDROXYL RADICALS,  
NUCLEOTIDES, DAMAGE, BIOCHEMISTRY (U)

THE EXTENT OF CHAIN BREAKAGE INDUCED BY FREE  
RADICAL ATTACK OF CALF THYMUS DNA IN DILUTE AQUEOUS  
SOLUTION HAS BEEN DETERMINED BY ASSAY OF LIBERATED  
PHOSPHOMONOESTER GROUPS. THE RELATIVE  
EFFECTIVENESS OF HYDROXYL RADICALS AND HYDRATED  
ELECTRONS AS INITIATORS OF THIS TYPE OF DAMAGE WAS  
INVESTIGATED IN BOTH NATIVE AND DENATURED DNA  
EXPOSED TO 6000 GAMMA AND 40 MEV ELECTRON  
RADIATION IN THE ABSENCE OF OXYGEN. APPROXIMATELY 8  
PERCENT OF AVAILABLE OH AND 6 PERCENT OF HYDRATED  
ELECTRONS REACT TO PRODUCE CHAIN BREAKS IN DOUBLE-  
STRANDED DNA, WHEREAS THESE VALUES ARE REDUCED TO 5  
PERCENT AND 1-2 PERCENT RESPECTIVELY, FOR THE  
DENATURED MATERIAL. THE DOUBLE HELICAL  
POLYNUCLEOTIDE STRUCTURE PROVIDES PROTECTION FOR  
REACTIVE SITES ON THE BASES WHICH ARE FULLY EXPOSED  
TO ATTACKING RADICALS IN SINGLE-STRANDED DNA. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD-A012 024 7/5 7/2 7/4  
CALIFORNIA UNIV LOS ANGELES INST OF GEOPHYSICS AND  
PLANETARY PHYSICS

THE CHEMISTRY OF MATERIALS UNDER EXTREME  
ENVIRONMENTAL CONDITIONS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 1 DEC 70-31 MAR 75,  
75 18P LIBBY, W. F. ;

CONTRACT: AF-AFOSR-2019-71

PROJ: AF-9538, AF-6813

TASK: 953802, 681303

MONITOR: AFOSR TR-75-0834

UNCLASSIFIED REPORT

DESCRIPTORS: \*CATALYSTS, \*RARE EARTH COMPOUNDS,  
\*PLASMAS(PHYSICS), \*RADIATION CHEMISTRY,  
SCIENTIFIC RESEARCH, ATMOSPHERIC CHEMISTRY,  
RADIOLYSIS, IONIZING RADIATION, CRYSTALS,  
DIAMONDS, HIGH PRESSURE, PLANETARY ATMOSPHERES  
IDENTIFIERS: \*ELECTRON TUNNELING

(U)

(U)

RESEARCH IS BRIEFLY SUMMARIZED IN THE AREAS OF RARE  
EARTH AUTO EXHAUST CATALYSTS, PLASMA CHEMISTRY, HIGH  
PRESSURE INORGANIC CHEMISTRY, RADIATION DAMAGE IN  
CRYSTALS, ELECTRON TUNNELING IN CHEMISTRY, AND HIGH  
PRESSURE ORGANIC CHEMISTRY.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOM07

AD-A018 510 7/5 20/12  
CALIFORNIA INST OF TECH PASADENA ARTHUR AMOS NOYES LAB OF  
CHEMICAL PHYSICS

AN APPROACH TO THE UNDERSTANDING OF RADIATION  
CHEMISTRY IN THE CONDENSED PHASE, (U)

FEB 75 6P BERG, JACQUELINE O. ;  
ROBINSON, G. WILSE ;  
CONTRACT: DAHC04-74-C-0010  
MONITOR: ARO 11783.6-C

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN CHEMICAL PHYSICAL  
LETTERS, V34 N2 P211-215, 15 JUL 75.

DESCRIPTORS: \*RADIATION CHEMISTRY, \*RELAXATION,  
\*SOLID STATE CHEMISTRY, \*ENERGY LEVELS,  
EXCITATION, ENERGY CONVERSION, ELECTRONS, IONS,  
FISSION, SOLID STATE PHYSICS, REPRINTS (U)  
IDENTIFIERS: CONDENSED PHASE (U)

THIS PAPER DESCRIBES A PURELY ELECTRONIC MECHANISM  
BY WHICH APPROX. 20 EV EXCITATIONS IN CONDENSED  
PHASES RELAX TO LOWER ENERGY STATES. THE MECHANISM  
UTILIZES AN ENERGY FISSION PROCESS WHEREBY AN IONIC  
OR EXCITONIC STATE SPLITS INTO TWO LOWER ENERGY  
STATES, AT LEAST ONE BEING LOCALIZED. THE MECHANISM  
EXPLAINS NOT ONLY THE KNOWN RAPIDITY OF SUCH PROCESS  
BUT ALSO SUGGESTS AN EXPLANATION FOR THE  
PROPORTIONATION OF THE CHEMISTRY BETWEEN IONIC AND  
ELECTRONICALLY EXCITED STATES. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A041 602 7/4 7/5  
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J

RADIATION DEGRADATION OF ALPHA-SUBSTITUTED  
ACRYLATE POLYMERS AND COPOLYMERS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
JUL 77 16P HELBERT, JOHN N. ;CAPLAN,  
PHILIP J. ;POINDEXTER, EDWARD H. ;  
REPT. NO. ECOM-4505  
PROJ: 1L161102AH47  
TASK: S7

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF APPLIED POLYMER  
SCIENCE, V21 P797-807 1977.

DESCRIPTORS: \*POLYMERS, \*COPOLYMERS, \*RADIATION  
CHEMISTRY, ELECTRON BEAMS, DEGRADATION, ELECTRON  
IRRADIATION, CROSSLINKING(CHEMISTRY), REPRINTS (U)  
IDENTIFIERS: WU011, ASH47, PE61102A (U)

RADIATION DEGRADATION IS OBSERVED IN POLY(METHYL  
ALPHA-CHLOROACRYLATE), POLY(METHYL ALPHA-  
CYANOACRYLATE), AND POLY(ALPHA-  
CHLOROACRYLONITRILE) HOMOPOLYMERS AND THEIR  
RESPECTIVE MMA COPOLYMERS WHEN GAMMA-IRRADIATED IN  
VACUO. POLYMER DEGRADATION SUSCEPTIBILITIES ARE  
QUANTIFIED IN TERMS OF G(SCISSION RADICALS) AND  
G(SCISSION)-G(CROSSLINKS), MEASURED BY EPR  
AND MEMBRANE OSMOMETRY, RESPECTIVELY; VALUES BY THESE  
TWO METHODS ARE COMPARED. HIGHER G(RADS) VALUES  
RANGING FROM 2 TO 6 AND (G(S)-G(X)) VALUES  
RANGING FROM 2 TO 11 ARE OBTAINED FOR THE SUBSTITUTED  
POLYMERS AND COPOLYMERS RELATIVE TO THE VALUES FOR  
PMMA (1.6; 1.9), A STANDARD E-BEAM POSITIVE  
RESIST, WHICH SUGGESTS THAT THESE MODIFIED POLYMERS  
ARE MORE SENSITIVE E-BEAM RESISTS THAN PMMA.  
(AUTHOR) (U)

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\*AEROJET--GENERAL NUCLEONICS SAN RAMON CALIF \* \* \*

AN1048  
SELECTED SYNTHESIS BY FISSION  
FRAGMENT RECOIL.  
AD- 422 205

\*AERONAUTICAL SYSTEMS DIV WRIGHT-PATTERSON AFB OHIO \* \* \*

ASD-TDR63 697  
RADIATION PHYSICS: ITS IMPACT  
ON INSTRUMENTATION.  
AD- 428 970

ASD-TDR63 785  
ELECTRON SPIN RESONANCE (ESR)  
STUDY OF GAMMA IRRADIATED SOLID  
ACETONITRILE.  
AD- 423 525

\*AEROSPACE CORP EL SEGUNDO CALIF LAB OPERATIONS \* \* \*

TR-0158(3250-20)-1  
PULSE RADIOLYSIS OF  
POLYSTYRENE,  
(SAMS0-TR-68-30)  
AD- 664 883

\*AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO \* \* \*

ARL 65-101  
RARE GAS SENSITIZED RADIOLYSIS  
OF ACETYLENE,  
AD- 616 958

ARL-65-102  
THE RADIOLYSIS OF PROPANE AT  
EXTREMELY LOW CONVERSIONS.  
AD- 618 155

ARL-65-157  
RADIATION CHEMISTRY OF ALKYL  
HALIDES.  
AD- 632 704

ARL-67-0110  
MASS SPECTROMETRIC

CORPORATE AUTHOR - MONITORING AGENCY

INVESTIGATION OF H. AND H2 TRANSFER  
REACTIONS OF HYDROCARBON IONS,  
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ORGANIC MOLECULES.  
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IONIC REACTIONS IN ETHYL  
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PHASE RADIOLYSIS OF HYDROCARBONS,  
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ARL-TN-60-183  
GAS PHASE RADIOLYSIS OF N-  
PENTANE,  
AD- 702 598

ARL-TN-60-188  
EXAMINATION OF GAMMA-IRRADIATED  
BENZENE FOR OPTICAL ACTIVITY,  
AD- 702 603

\*AIR FORCE CAMBRIDGE RESEARCH LABS  
HANSCOM AFB MASS \* \* \*

AFCLRL-68-0350  
RADIATION DAMAGE AND CHEMICAL  
REACTIONS INDUCED IN CRYSTALLINE  
SOLIDS BY HIGH-ENERGY PROTON  
BOMBARDMENT.  
AD- 676 655

AFCLRL-70-0594  
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REACTIONS INDUCED IN CRYSTALLINE  
SOLIDS BY HIGH-ENERGY PROTON  
BOMBARDMENT.  
AD- 718 433

\*AIR FORCE CAMBRIDGE RESEARCH LABS L 6  
HANSCOM FIELD MASS \* \* \*

AFCLRL-63 587

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A REVIEW,  
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\*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO \* \* \*

AFIT-GNE/PHYS/64 2  
RADIOLYSIS OF PROPANE AT LOW  
CONVERSION.  
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\*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF  
ENGINEERING \* \* \*

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RADIOLYSIS OF SOLID ETHYL  
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AD- 605 457

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ORGANIC RADIATION CHEMISTRY.  
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\*AIR FORCE OFFICE OF SCIENTIFIC  
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YIELDS OF HEAVY HYDROCARBONS FROM  
SOLID METHANE BY IONIZING  
RADIATION,  
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CHEMISTRY. RADIOCHEMICAL CIS-TRANS  
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SOLID METHANE,  
AD- 653 381

AFOSR-68-0941  
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SECONDARY ELECTRONS WITH CHEMICAL  
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SOLUTIONS OF CYSTEINE IN THE  
PRESENCE OF OXYGEN,  
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RADIOLYSIS OF METHANE IN LIQUID  
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OXYGENATED AQUEOUS SOLUTIONS OF  
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GENERAL THEORY PARTICULARLY FOR THE  
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SATURATED HYDROCARBONS,  
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IRRADIATED ALKALINE ICE,  
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SCAVENGER EFFECTS ON ELECTRONS  
PRODUCED BY GAMMA RAYS AND  
PHOTOIONIZATION IN ALKALINE ICES AT  
77 K,  
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PROTECTING AGENTS,  
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BY GAMMA RAYS IN ALCOHOL-WATER  
MIXTURES AT 77K,  
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CYSTEINE SOLUTIONS AT NEUTRAL PH.  
THE ROLE OF RSSR AND OXYGEN,  
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ISOMERIZATION OF CIS-1,2-  
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OPTICAL ABSORPTION  
CHARACTERISTICS AND PHOTBLEACHING  
BEHAVIOR OF TRAPPED ELECTRONS IN  
GAMMA-IRRADIATED ALKALINE ICE,  
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ENERGY MIGRATION IN IRRADIATED  
SOLIDS.  
AD- 730 383

AFOSR-TR-71-2466  
EPR STUDIES OF MULTIPLE SILVER  
ATOM TRAPPING SITES PRODUCED IN  
GAMMA-IRRADIATED FROZEN SILVER  
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OPTICAL BLEACHING EFFECTS ON  
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TRAPPED ELECTRONS IN  
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RADIOLYSIS OF MEDICINE, ETHANE, AND  
ETHYLENE SOLUTIONS IN LIQUID ARGON,  
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- AFOSR-TR-72-1429  
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TRAPPED ELECTRONS IN  
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PHOTOCONDUCTIVITY AND OPTICAL  
BLEACHING STUDIES,  
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MATRIX (ELECTRON NUCLEAR  
RESONANCE) ENDOR LINEWIDTHS OF  
TRAPPED ELECTRONS IN GLASSY  
MATRICES AT 77 K,  
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- AFOSR-TR-72-1906  
APPLICATION OF THE  
SEMICONDUCTOR MODEL TO THE EFFECT  
OF DIPOLE REORIENTATION ON TRAPPED  
ELECTRON SPECTRA IN GLASSY ETHANOL,  
AD- 749 567
- AFOSR-TR-72-2267  
THERMALLY STIMULATED  
CONDUCTIVITY OF GAMMA-IRRADIATED  
TRIETHYLAMINE AND 3-METHYLPENTANE  
GLASSES,  
AD- 752 645
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EXCITED STATE FORMATION IN THE  
IRRADIATION OF 1, 3-CYCLOHEXADIENE,  
AD- 776 827
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PROPERTIES OF ENERGETIC IONS  
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FUTURE ENERGY SOURCES,  
AD- 780 613
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CONDITIONS,  
AD-A012 024
- \*AIR FORCE WEAPONS LAB KIRTLAND AFB N  
MEX  
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AFWL-TR-64-147  
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UNSATURATION CHANGES IN MARLEX 6002  
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AD- 611 575
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HYDROGEN PRESSURE ON THE HYDROGEN  
YIELD FROM XIRRADIATED  
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AD- 611 561
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SATURATED HYDROCARBONS.  
AD- 632 666
- \*AKRON UNIV OHIO INST OF POLYMER  
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LOW TEMPERATURE POLYMERIZATION.  
AD- 481 674
- \*AKRON UNIV OHIO INST OF RUBBER  
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- LOW TEMPERATURE POLYMERIZATION  
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AD- 613 529
- LOW TEMPERATURE POLYMERIZATION  
STUDIES.  
AD- 623 307
- \*ALBERTA UNIV EDMONTON DEPT OF  
CHEMISTRY  
\* \* \*  
RADIOLYSIS OF CYCLOHEXANE, V.  
PURIFIED LIQUID CYCLOHEXANE AND  
SOLUTIONS OF ADDITIVES,  
AD- 617 580
- RADIATION-INDUCED DIMERIZATION  
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EFFECTS AND THE FORMATION OF THE  
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- \* \* \*  
THE RADIOLYSIS OF LIQUID  
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- \* \* \*  
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ATOM SCAVENGING IN THE RADIOLYSIS  
OF LIQUID SATURATED HYDROCARBONS,  
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IN THE PRESENCE OF DEUTERATED  
OLEFINS. THE INVOLVEMENT OF THE  
OLEFINS IN HYDROGEN FORMATION,  
AD- 699 668
- \*AMERICAN OIL CO WHITING IND  
\* \* \*  
THE RADIATION CHEMISTRY OF  
ACETYLENIC COMPOUNDS.  
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- \*ARMED FORCES INST OF PATHOLOGY  
WASHINGTON D C  
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BEHAVIOR OF UNSATURATED FATTY  
ACIDS IN THE THIOBARBITURIC ACID  
TEST AFTER RADIOLYSIS,  
AD- 615 704
- \*ARMED FORCES RADIOBIOLOGY RESEARCH  
INST BETHESDA MD  
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AFFRI-SR74-3  
FREE RADICAL-INDUCED CHAIN  
BREAKAGE IN IRRADIATED AQUEOUS  
SOLUTIONS OF DNA,  
AD-A008 148
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AFRPT-TN72-2

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ARM-ARM

DIGITAL RECORDING OF EAST  
NONRECURRENT PHENOMENA IN PULSE  
RADIOLYSIS STUDIES.  
AD- 742 077

\*ARMY BIOLOGICAL LABS FREDERICK MD  
\* \* \*

TRANS-2411  
APPLICATION OF THE HIGH-  
FREQUENCY ELECTRICAL CONDUCTIVITY  
METHOD FOR THE STUDY OF ADSORPTION  
PROPERTIES OF IRRADIATED PROTEINS,  
AD- 685 402

\*ARMY ELECTRONICS COMMAND FORT  
MONMOUTH N J INST FOR EXPLORATORY  
RESEARCH

\* \* \*  
POLYMER FORMATION IN IRRADIATED  
LIQUID PYRIDINE,  
AD- 634 461

\* \* \*  
Y(2+) AS A COLOR CENTER IN  
IRRADIATED CAF2,  
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\*ARMY ELECTRONICS COMMAND FORT  
MONMOUTH N J \* \* \*

ECON-4053  
SPECTRAL IDENTIFICATION OF  
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SURVEY,  
AD- 753 917

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SUBSTITUTED ACRYLATE POLYMERS AND  
COPOLYMERS.  
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\*ARMY ELECTRONICS LABS FORT MONMOUTH N  
J \* \* \*

TR-2485  
EFFECTS OF IONIZING RADIATION  
ON PYRIDINE,  
AD- 605 430

\*ARMY FOREIGN SCIENCE AND TECHNOLOGY

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CENTER CHARLOTTEVILLE VA

\* \* \*  
FSTC-HT-23-323-71  
INVESTIGATION OF THE KINETIC  
AND SPECTRAL CHARACTERISTICS OF THE  
PRIMARY PARTICLE IN PULSE  
RADIOLYSIS,  
AD- 727 949

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FSTC-HT-23-324-71  
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PARAMAGNETIC CENTERS OF THE  
IRRADIATED PROTEINS,  
AD- 754 145

\* \* \*  
FSTC-HT-23-445-73  
RADIOLYSIS OF CRYSTALLINE  
AZIDES, BROMATES AND NITRATES  
(RADIOLIZ KRISTALLICHESKIKH AZIDOV,  
BROMATOV I NITRATOV),  
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FSTC-HT-23-913-73  
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RADIATION CHEMISTRY OF SOLIDS,  
AD- 785 971

\*ARMY FOREIGN SCIENCE AND TECHNOLOGY  
CENTER WASHINGTON D C  
\* \* \*

FSTC-HT-23-136-68  
PRIMARY PRODUCTS OF THE  
RADIOLYSIS OF WATER AND THEIR  
REACTIVITY,  
AD- 850 946

\* \* \*  
FSTC-HT-23-139-70  
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RADIOCHEMICAL SENSITIZATION EFFECT  
IN RUBBER (ISSLEDOVANIE EFEKTA  
SENSIBILIZATSII RADIATSIONNO  
KHLMICHEKIKH PROTSESSOV V  
KAUCHUKAKH),  
AD- 701 946

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FSTC-HT-23-141-70  
MECHANISM OF IONIZING-RADIATION  
ACTION ON SULFOCATIONS (O  
MEKHAUZME DEISTVIYA  
IONIZIRUYUSHCHEGO IZLUCHENIYA NA  
SULFOKATIONITY),

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AD- 700 348

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FSTC-HT-23-209-6A  
STUDY OF RADIATION-INDUCED  
POLYMERIZATION, PART II:  
RADIATION-INDUCED POLYMERIZATION OF  
CHLOROPRENE,  
AD- 842 191

\* \* \*  
FSTC-HT-23-273-68  
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POLYMERIZATION OF POLYFUNCTIONAL  
VINYLSILOXANE,  
AD- 836 970

\* \* \*  
FSTC-HT-23-279-6A  
SOME ASPECTS OF KINETICS OF  
SOLID PHASE POLYMERIZATION,  
AD- 687 756

\* \* \*  
FSTC-HT-23-380-69  
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OLIGO(ETHYLENEGLYCOL-MALEATE-  
ADIPATE) WITH VARIOUS MONOMERS,  
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