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GORDON RESEARCH CONFERENCE ON HIGH TEMPERATURE
CHEMISTRY (1982) TILTON SCHOOL TILTON NEW HAMPSHIRE
JULY 26-30 1982(U) GORDON RESEARCH CONFERENCES INC

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UNCLASSIFIED

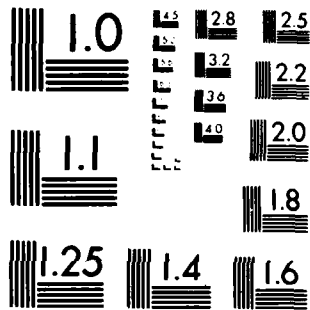
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Final Report to the
Office of Naval Research
Department of the Navy
800 North Quincy Street
Arlington, Virginia 22217

1982 GORDON RESEARCH CONFERENCE
ON
HIGH TEMPERATURE CHEMISTRY

July 26-30, 1982
Tilton School
Tilton, New Hampshire

SECRET
JAN 4 1983
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Wayne L. Worrell
Wayne L. Worrell
Conference Chairman
University of Pennsylvania
Philadelphia, Pa. 19104

Alexander M. Quickshank
Alexander M. Quickshank
Director, Gordon Research Conference
Department of Chemistry
University of Rhode Island
Kingston, Rhode Island 02881

Karl E. Spear
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Pennsylvania State University
University Park, Pa. 16802

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August, 1982

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Final Report to the
Office of Naval Research
1982 Gordon Research Conference on
High Temperature Chemistry
July 26-30, 1982
Tilton School
Tilton, New Hampshire

Conference Chairman
Wayne L. Worrell
Materials Science Department/K1
University of Pennsylvania
Philadelphia, Pa. 19104
(215) 243-3592

Vice Chairman
Karl E. Spear
Materials Research Lab.
Pennsylvania State University
University Park, PA 16802
(814) 865-1198

Background and Nature of Conference

The Gordon Research Conference on High Temperature Chemistry has been held biennially since 1960. As such, it is the only regularly scheduled international meeting where the interdisciplinary group comprising high temperature science can interact and discuss forefront issues of the day. Gordon Conference surveys of past participants have indicated this conference to be extremely helpful in the generation of new research ideas and contacts. The mix of foreign, local, academic, industrial and government participants is also a recognized hallmark of such meetings.

The 1982 Conference had 17 invited talks in the areas of:

- Kinetics of Gas Phase Reactions;
- Surface Reactions;
- Chemical Vapor Transport;
- Novel Investigations of Corrosion Reactions
- Thermodynamics of Liquids and Glasses;
- Solid State Electrochemistry;

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- Nuclear Reactor Accident Modeling and High Temperature Chemistry
- Ab Initio Calculations of Molecular Structure and Properties
- Spectroscopy of High Temperature Molecules

There were 38 invited poster presentations, which provided an additional forum for in-depth discussions of other active research topics in the field. The conference program and a list of invited poster papers are attachments A and B, respectively.

The conference had a total attendance of 105, including 20 from industrial laboratories, 30 from governmental laboratories, 40 from Universities and 15 from outside the U.S. Attachment C is a list of participants.

In accordance with Gordon Conference policy, no printed abstracts or papers were produced or distributed. The minutes of the conference business meeting, as prepared by the conference secretary, Dr. Clifford Myers, are appended as Attachment D.

Finances

A total of \$19,000 was available for disbursement by the conference chairman. Of this amount, the Gordon Research Conference provided \$7,500 (from conference fees), the Morgantown Energy Technology Center (METC) contributed \$15,000, the Office of Naval Research (ONR) - \$3,000, the General Electric Company \$2,000, and IBM - \$7,500. These funds were used to offset the fixed conference fee (\$230) and/or travel expenses of key participants - primarily speakers and discussion leaders. Fifteen young scientists (postdoctoral and graduate students), whose attendance would otherwise not have been possible, were also supported by this fund. A budget summary of the ONR contribution is given in Attachment E.

Acknowledgment and Comments

Partial support of this conference by ONR is gratefully acknowledged. The 1982

Conference was pertinent to many of the naval research interests, particularly in the areas of corrosion reactions, solid-state electrochemistry, surface reactions and chemical vapor transport. We are confident that the free exchange of forefront information, so evident at this conference, will be beneficial to existing and future ONR supported programs.

HIGH TEMPERATURE CHEMISTRY

July 26-30, 1982
Tilton School, Tilton, New Hampshire

Wayne L. Worrell, Chairman, and Karl E. Spear, VC

Monday, July 26

Kinetics of Gas Phase Reactions

D. L. Hildenbrand, Discussion Leader

'Kinetic Measurements of Free Radical
and Gaseous Species'

C. E. Kolb
Aerodyne Research, Inc.

"The Oxidation of Alkaline Earth Metal
Vapors by N_2O "

P. J. Dagdigan
John Hopkins University

Surface Reactions

G. M. Rosenblatt, Discussion Leader

"Relationships between Surface Structure
and Catalytic Reactivity"

D. Wayne Goodman
Sandia National Laboratories

"Chlorine Reactions at Metal-Oxide
Surfaces"

P. Nordine
Yale University

"Invited Poster Session on Recent Advances
in High Temperature Chemistry"

Tuesday, July 27

Chemical Vapor Transport

P. Gilles, Discussion Leader

"Complex Halide Vapors and their
Significance in Vapor Transport"

H. Oye
Norwegian Institute of Technology

"Chemical Vapor Transport and Thermodynamic
Analysis of Metal-Chalcogenide-Halide
Systems"

H. Wiedemeier
Rensselaer Polytechnic Institute

Novel Investigations of Corrosion Reactions

J. B. Wagner, Jr., Discussion Leader

"Hot Corrosion Reactions of Metals with
Thin Salt Films"

R. A. Rapp
Ohio State University

"In-situ Raman Spectroscopic Character-
ization of Corrosion Reaction Products"

A. S. Nagelberg and J. C. Hamilton
Sandia National Laboratories

"Invited Poster Session on Recent Advances
in High Temperature Chemistry"

Wednesday, July 28

Thermodynamics of Liquids and Glasses

L. Brewer, Discussion Leader

"Thermodynamic Properties of Ordered
Liquid Mixtures"

M. Blander
Argonne National Laboratory

Wednesday, July 28, continued

'Structural Interpretations of the
Thermodynamic Properties of Glasses and
Crystals'
Solid State Electrochemistry

A. Navrotsky
Arizona State University

C. B. Alcock, Discussion Leader

'Transport Properties of Some Transition-
Metal Oxides'

R. Dieckmann
Universitat Hannover

'High Conductivity Solid Electrolytes'

G. C. Farrington,
University of Pennsylvania

'Invited Poster Session on Recent
Advances in High Temperature Chemistry'

Thursday, July 29

Ab Initio Calculations of Molecular
Structure and Properties

W. Weltner, Discussion Leader

'Ab Initio Calculations of the Structure
and Properties of Transition-Metal Gaseous
Hydrides'

H. F. Schaefer
University of California, Berkeley

'Ab Initio Calculations of the Properties
of Molecules and "Atomic Clusters": Current
Capabilities and Future Prospects'

J. O. Arnold
NASA-AMES Research Center

Nuclear Reactor Accident Modeling and
High Temperature Chemistry

Overview D. D. Cubicciotti
Electric Power Research Institute

Specific Aspects

D. Olander, University of California
M. Adamson, General Electric Vallecitos
R. Sallach, Sandia National Laboratories
P. Potter, AERE, Harwell

Friday, July 30

Spectroscopy of High Temperature
Molecules

J. W. Hastie, Discussion Leader

'Spectroscopy in Supersonic Molecular
Beams: The Fluorescence of NaI'

D. H. Levy
University of Chicago

'Magnetic Circular Dichroism Spectra of
Matrix Isolated High Temperature
Molecules'

M. Vail
University of Florida

POSTER PAPERS FOR GORDON RESEARCH CONFERENCE ON
HIGH TEMPERATURE CHEMISTRY
Tilton School, Tilton, New Hampshire
July 26-30, 1982

- Poster # Presentation on Monday, on display Monday and Tuesday
- 1 E. Fitzer and K. Brennfleck, University of Karlsruhe, West Germany
"Superconducting Nb(C,N) layers on carbon fibers by chemical vapor
deposition and subsequent surface reactions"
- 3 E.C. Beahn and O.L. Culberson, Oak Ridge National Laboratory
"Uncertainty analysis in thermodynamic calculations"
- 5 N.L. Saboungi, R.H. Yonco, Argonne National Laboratory and
O. J. Kleppa, University of Chicago:
"Enthalpy of mixing of liquid Rb-Au alloys"
- 7 R.D. Brittain, D.L. Hildenbrand and K.H. Lau, SRI International:
"Thermodynamics of metal sulfate decomposition"
- 9 J.G. Edwards, R. Haque, S. Kshirsagan, and A. Qusti, University of Toledo:
"Discoveries about ternary sulfides through high-temperature
vaporization studies"
- 11 R. Schiffman and P. Nordine, Yale University:
"Containerless high temperature investigations by laser induced
atomic fluorescence"
- 13 R. Schoonmaker, Oberlin College:
"Scattering of molecular beams from surfaces: dynamics of gas-surface
interactions and the mechanism of condensation of cesium atoms and alkali
halide molecules of NaCl (100)"
- 15 D. M. Speros, General Electric Co., Cleveland:
"Correlation between kinetic, crystallographic (surface structural)
and thermodynamic quantities: Part I: Thermal dissociation of certain
solids"
- 17 R. W. Ohse, J.F. Babelot, J. Magill (European Institute for Transuranium
Elements, Karlsruhe, W-Germany), C. Cercignani (Istituto di Matematica del
Politecnico di Milano, Italy), A. Frezzotti (DIRES RICE-Alfa Romeo, Milano,
Italy), and J.P. Hiernaut, M. Hoch (University of Cincinnati):
"High temperature vaporization of uranium oxide - consistency of mass
spectrometric and depth measurement with thermodynamic calculations of the
vapor pressure over UO₂ up to 5000 K"
- 19 J. Hvistendahl (University of Tennessee), P. Klaeboe (University of Oslo,
Norway) and E. Rytter, H.A. Øye (Norwegian Institute of Technology,
Trondheim, Norway):
"Emission IR spectra of chloroaluminate melts, improved technique for
obtaining emission spectra of melts"
- 21 Dean E. Peterson, Los Alamos National Laboratory:
"Thermodynamics of Actinide Intermetallics"
- 23 J. M. Leitnaker, Oak Ridge Gaseous Diffusion Plant:
"Thermodynamics of uranium-fluorine compounds"

10 FEB 1978 (continued)

Poster #

Presentation on TUESDAY, on display Monday and Tuesday

- 2 E. Fitzer, J. Daimer and J. Schlichting, University of Karlsruhe, W-Germany
"Kinetics and mechanism of the formation of self healing oxide layers on complex high temperature Si/Cr/Si/Ta coatings and their attack under hot corrosion environments"
- 4 M.A. Frisch, IBM Thomas J. Watson Research Center
"Vaporization studies of non-congruent systems using modulated beam mass spectrometry"
- 6 F. J. Kohl and J. L. Smialek, NASA Lewis Research Center
"Al₂O₃ scale degradation by an applied electric field"
- 8 H. Tetenbaum, Argonne National Laboratory
"High temperature vaporization behavior of the solid breeder blanket Li-O-H system"
- 10 A. H. Oner, Yale University
"Transient studies of gasification kinetics by plasma emission spectroscopy"
- 12 S.A. Arthers, I.R. Beattie, T.R. Gilson, R.A. Gomme, S.N. Jenny, P.J. Jones, J.S. Ogden, J. Parkinson, and S. J. Williams, University of Southampton, England
"Vibrational spectroscopy in the characterisation of high temperature vapours and melts with particular reference to alkali metal salts of oxoanions"
- 14 C.W. Draper, Western Electric Co., Princeton
"laser surface melting and alloying: a new method for producing metastable crystalline and amorphous metal surfaces"
- 16 V. B. Tare and J.B. Wagner, Jr., Arizona State University
"Electrical Conduction in Two Phase Nickel Oxide-Nickel Sulfide Mixtures"
- 18 H.G. Adamson and R.W. Caputi, General Electric Co., Vallecitos Nuclear Center
"Melting temperature determinations and urania-fission product systems with up to 5 components"
- 20 (a) J. Janitsch, K.L. Komarek and J. Mikler, University of Vienna, Austria
"Calorimetric measurements on liquid gold-indium alloys"
- (b) R. Krachler, P. Terzieff, H. Ipser and K.L. Komarek, University of Vienna, Austria
"Magnetic and thermodynamic properties of solid B'-AuMn"
- 22 P.D. Kleinschmidt and J.W. Ward, Los Alamos National Laboratory
"The role of f-electrons in actinide metal bonding"
- 24 C.E. Meyers, State University of New York, Binghamton
"Thermodynamic stabilities of transition metal phosphides and -related compounds"

POSTER PAPERS (continued)

Poster Presentations on WEDNESDAY, on display Wednesday and Thursday

- 1 H. Saltsburg and T. Kilian, University of Rochester
'Observations of surface wiremen during a heterogeneous catalytic reaction'
- 3 B. Halpern and E. Lutat (Yale University), D. Gross (Harvard University) and L. Doeven (University of Rochester)
'Thermionic emission from incandescent Pt during the surface decomposition of hydrocarbons and the oxidation of adsorbed carbon'
- 5 R.J. Van Zee, C.A. Baumann, S.C. Bhat and V. Veltner, Jr., University of Florida
'high temperature metal molecules'
- 7 K.E. Johnson, University of Regina, Canada
'Electrochemical promotion and following of high temperature reactions'
- 9 P.A. Montano and J.M. Nagarathna, West Virginia University
'Electronic structure of bimetallic molecules of FeCr, FeSn and FePt'
- 11 J.W. Hastie, D.W. Bonnell and W.S. Horton, National Bureau of Standards
'Activity and phase equilibria models of high temperature liquid-solid-glass-gas systems'
- 13 Z.K. Ismail, L. Fredin, R.H. Hauge, V.E. Billups and J.J. Margrave, Rice University
'New Reactions of Metal Atoms'
- 15 D.J. Frurip and H. Blander, Argonne National Laboratory
'Production of sub-micron metal alloy and ceramic powders via laser pyrolysis'
- 17 D.W. Bonnell and J.W. Hastie, National Bureau of Standards
'Fragmentation temperature dependence in electron impact ionization of molecular beams'
- 19 M.W. Chase, Dow Chemical Company
'JANAF thermochemical tables - reanalysis of the elements including sulfur and manganese'
- 21 P. Kofstad, University of Oslo, Norway
'Defects and Diffusion in metal deficient oxides'
- 23 J.E. Kingcade, Jr. and K.A. Gingerich, Texas A&M University
'Gaseous transition metal compounds with carbon, silicon, germanium, and tin'
- 24 O.J. Kleppa, University of Chicago
'Thermochemistry of borides by high temperature solution calorimetry'

GORDON RESEARCH CONFERENCES

ATTACHMENT C

HIGH TEMPERATURE CHEMISTRY

Tilton School, Tilton, New Hampshire
July 26-30, 1932K=Knowles
P=Pfeiffer
B=Beaumont
M=Mansion

Alcock, Charles	120 wk	Casleton, Kent H.	336 wk
Dept. of Metallurgy & Materials Science		USDOE/Morgantown Energy Technology Center	
University of Toronto, Canada		P.O. Box 880, Collins Ferry Road	
		Morgantown, WV 26505	
Arnold, James O.	343 wk	Chase, Malcolm W.	7 b
NASA-Ames Research Center Moffett Field		The Dow Chemical Co., 1707 Building	
CA 94035		Midland, MI 48640	
Bamberger, Carlos	104 ek	Crumley, Winfred	226 wk
Oak Ridge National Laboratory, P.O. Box X		Georgia Institute of Technology, 225	
Oak Ridge TN 37830		North Ave., Chemistry	
		Atlanta GA 30332	
Beahm, Edward C.	115 ek	Cubicciotti, D.	6 b
Oak Ridge National Laboratory, P.O. Box X		Electric Power Research Institute	
Bldg 4501, Oak Ridge, TN 37830		Box 10412, Palo Alto, CA 94303	
Beattie, Ian	344 wk	Culberson, Oran L.	5 b
The University, Southampton SO9 5NH		Engr. Coord. & Anal. Section, Oak Ridge	
Hampshire, England 0703		National Lab., Oak Ridge, TN 37830	
Blackburn, Paul E. and Joy	25 p	Dagdikian, Paul J.	336 wk
Argonne National Laboratory, 9700 S. Cass		Johns Hopkins University, Dept. of Chemistry	
Argonne, IL 60439		Baltimore, MD 21218	
Blander, Milton	off campus	Davies, Peter	246 wk
Argonne National Lab., 9700 S. Cass Ave.,		Arizona State University	
Argonne, IL 60439		Tempe, AZ 85281	
Bonnell, David	344 wk	Dieckmann, R. and Christine	31p
National Bureau of Standards		University of Hannover, Institute for	
4329/223 Div. 561, Washington, DC 20234		Physical Chemistry, Hannover, W-Germany	
Botor, Jan P.	342 wk	Draper, Clifton	4 b
University of Toledo		Western Electric Engineering Research Ctr.	
		P.O. Box 900, Princeton, NJ 08540	
Bowker, Jeffrey	103 ek	Drowart, John	220 ek
Calgon Corp., P.O. Box 1346		Vrije Universiteit Brussel, Pleinlaan 2	
Pittsburgh, PA 15230		B-1050 Brussels, Belgium	
Brennfleck, Karl	227 wk	Edwards, Jimmie and Carol	21 p
Kaiserstrasse 12 7500 Karlsruhe		The University of Toledo, 2801 W. Bancroft	
		Chemistry, Toledo, Ohio 43606	
Brewer, Leo	18 b	Faizi, Edgar	341 wk
Lawrence Berkeley Lab. University of Calif.		University of California, Dept of Chemistry,	
Dept. of Chemistry Berkeley, CA 94720		Berkeley, CA 94720	
Brittain, Robert	337 wk	Fontijn, Arthur	245 wk
SRI International, 333 Ravenswood Ave.,		Dept. of Chemistry, Rensselaer Polytechnic	
Menlo Park, CA 94025		Inst. Troy, NY 12101	
Carlson, K. Douglas	19 b		
Argonne National Lab., Chemistry Division			
9700 S. Cass Ave., Argonne, IL 60439			

Lischn, Margaret A. IBM Research, P.O. Box 210 Yorktown Heights, NY 10541	8 m	Johnson, Ernest Monsanto Research Corp., Mound Facility Miamisburg, OH 45342	233 wk
Gilles, Paul W. University of Kansas, Dept. of Chemistry Lawrence, KS 66045	244 wk	Johnson, Keith University of Regina, Chemistry Dept. Regina Sask S4S 0A2	217 wk
Gole, James Georgia Institute of Technology 225 North Avenue, Chemistry Atlanta, GA 30332	226 wk	Johnston, Graham Naval Research Lab., Code 6395 Washington, DC 20375	off campus
Goodman, David GTE Sylvania, 100 Endicott St., Danvers, MA 01923	244 wk	Kay, Jack Drexel University, Dept. of Chemistry Philadelphia, PA 19104	214 wk
Goodman, D. Wayne Sandia National Labs, Division 5114 Albuquerque, NM 87185	245 wk	Kessinger, Glen University of Kansas, Dept. Chemistry Malott Hall, Lawrence, KS 66045	342 wk
Green, David Argonne National Lab., 9700 S. Cass Ave., Argonne, IL 60436	242 wk	Kingcade, Joseph Texas A&M University, Chemistry Dept. College Station, TX 77843	214 wk
Gulbransen, Earl and Margery University of Pittsburgh, 843 Benedum Hall Pittsburgh, PA 15235	22 p	Kleinschmidt, Phillip Los Alamos National Lab., Mail Stop G 730/CHE-5, Los Alamos, NM 37545	207 wk
Guerra-Brady, Victoria and Roger University of Pennsylvania, 3231 Walnut St., Philadelphia, PA 19104	20 p	Kleppa, Ole University of Chicago, James Franck Inst. 5640 S. Ellis Ave., Chicago, IL 60637	232 wk
Halpern, Bret Yale University, Dept. Chemical Eng. Box 2159 Yale Station New Haven, CT 06520	137 wk	Kohl, Fred Nasa Lewis Research Center, 2100 Brookpark Cleveland, OH 44135	231 wk
Hamilton, John C. Sandia National Laboratory, Division 8342 Livermore, CA 94550	24 wk	Kolb, Charles Aerodyne Research, Inc., 45 Manning Road Billerica, MA 01821	230 wk
Hange, Robert Rice University, P.O. Box 1892, Chemistry Houston, TX	240 wk	Komarek, Kurt University of Vienna, Inorganic Chemistry A-1090 Vienna, Austria	229 wk
Hastie, John W. National Bureau Standards Washington, DC 20236	234 wk	Kramer, Carolyn Naval Research Lab., Chemistry Division Code 6135, Washington, DC 20375	3 m
Hildenbrand, Donald SRI International, Menlo Park, CA 94025	213 wk	Lau, Kai-Hung SRI International, 333 Ravenswood Ave., Menlo Park, CA 94025	337 wk
Hvistendahl, Jan University of Tennessee, Dept. of Chemistry Knoxville, TN 37910	14 b	Leitnaker, James Union Carbide Corp., Bldg K-1006, MS-271 Oak Ridge, TN 37830	342 wk
Jacobson, Nathan U. of Pennsylvania, 3231 Walnut, Philadelphia, PA 19104	217 wk	Levy, Donald H. University of Chicago, 5640 S. Ellis Ave., Chicago, IL 60637	207 wk

Temperature Chemistry, 1964
Levinsky, Milton and Barbara 10 p
Johns Hopkins Applied Physics Lab.
Johns Hopkins Rd., Laurel, MD 20707

McNinn, T. D. 225 wk
Monsanto, 800 North Lindbergh Blvd.
St. Louis, MO 63166

Montano, Pedro and Liliana 19 p
West Virginia University, Dept. of Physics
Morgantown, WV 26506

Murad, Edmond 218 ek
Air Force Geophys. Lab., Hanscom, AFB MA
01731

Myers, Clifford and Marilyn 3 p
State University of New York, Dept. Chemistry
Binghamton, NY 13901

Nagelberg, Alan 204 ek
Sandia National Labs, Division 8313
Livermore, CA 94550

Navrotsky, A. 9 m
Arizona State University, Dept. Chemistry
Tempe, AZ 85287

Nordine, Paul 204 ek
Yale University, P.O. Box 2159Y
New Haven, CT 06520

Norman, John 10 b
P.O. Box 81608, San Diego, CA 92138

Ohse, Roland 225 wk
Commission of European Communities
Postfach 2266, D-7500 Karlsruhe 1
Federal Republic of Germany

Oner, Atilla 134 wk
Yale University, Chemical Eng. Dept.
New Haven, CT 06520

Øye, Harald 15 b
Institute of Inorganic Chemistry NTR
Sem Saelands vei 12, 7034 Trondheim Norway

Park, Chong 12 b
Ohio State University, Metallurgical Dept.
116 W. 19th Ave., Columbus, OH 43210

Plante, Ernest 132 wk
National Bureau of Standards, A329 Mtl
Washington, DC 20234

Peterson, Dean 133 wk
Los Alamos National Lab., MS730/CMB-5
Los Alamos, NM 87545

United Kingdom Atomic Energy Authority
UKAEA Harwell, Oxon England

Rapp, Robert off campus
Ohio State University, 116 West 19th Ave.,
Columbus, OH 43210

Rosenblatt, GERALD 202 ek
Los Alamos National Laboratory
Chemistry Div., Los Alamos, NM 87545

Russell, Timothy 132 wk
General Electric Co., Lighting Business
Group #1310, Mela Park, Cleveland, OH 44112

Saboungi, Marie-Louise off campus
Argonne National Lab., 9700 S. Cass Ave.,
Argonne, IL 60439

Sallach, Robert 341 wk
Sandia National Labs., P.O. Box 5800
Albuquerque, NM 87185

Saltsburg, Howard 338 wk
University of Rochester, Dept. Chemical Eng.
Rochester, NY 14627

Schaefer, Henry 11 b
Dept of Chemistry, University of California
Berkeley, CA 94720

Schiffman, Robert 128 wk
Yale University, P.O. Box 2159 Yale Station
New Haven, CT 06520

Schoonmaker, Richard and Dina 13 p
Oberlin College, Dept. of Chemistry
Oberlin, OH 44074

Shumaker, Craig 128 wk
Standard Oil Co., 3092 Broadway Ave.,
Cleveland, OH 44115

Simpson, Wade 1 p
University of Kansas, Dept. of Chemistry
Lawrence, KS 66044

Spear, Karl and Nancy 2 p
Pennsylvania State University
270 Materials Res. Lab., University Park,
PA 16802

Speros, Dimitri and Nel 12 p
General Electric, Lighting Research
Nela Park, Cleveland, OH 44112

Tare, Vasudeo 127 wk
Arizona State University, Ctr Solid State
Science, Tempe, AZ 85287

High Temperature Chemistry -4-, 1982

Tetenbaum, Marvin and Zelda 11 p
Argonne National Lab., 9700 S. Cass Ave.,
Argonne, IL 60439

Thorn, Robert 203 ek
Argonne National Lab., 9700 S. Cass Ave.,
Argonne, IL 60439

Topor, Letitia 4 m
University of Chicago, James Franck Inst.
5640 S. Ellis Ave., Chicago, IL 60637

Uchida, Takaski off campus
University of Pennsylvania, Material Sci.
& Eng. 3231 Walnut St., Philadelphia, PA
19104

Vala, Martin 127 wk
University of Florida, Leigh Hall
Chemistry, Gainesville, FL 32611

Van Zee, Richard and Margaret 9 p
Chemistry Dept. University of Florida
Box 565 Gainesville, FL 32611

Wagner, J. Bruce, Jr. 126 wk
Arizona State University
Center for Solid State Science
Tempe, AZ 85018

Wahlheck, Phillip 116 ek
Wichita State University, Chemistry
Wichita, KS 67208

Weltner, William, Jr. 205 ek
University of Florida, Chemistry
Gainesville, FL 32611

White, Philip 116 ek
GTE Products Corp., 100 Endicott St.,
Danvers, MA 01923

Wiedemeier H. 339 wk
Rensselaer Polytechnic Institute
Chemistry, Troy, NY 12181

Worrell, Wayne 136 wk
University of Pennsylvania
3231 Walnut St., Material Science
Philadelphia, PA 19104

Yoon, Seung Ryul off campus
University of Pennsylvania, Dept. MSE
3231 Walnut St., Philadelphia, PA 19104

Zubler, Edward 125 wk
General Electric Co., Nela Park 1310
Cleveland, OH 44112

Adamson, Martyn 343 wk
General Electric Co., P.O. Box 460
Pleasanton, CA 94566

Farrington, Gregory 3 b
U. of Pennsylvania, 3231 Walnut St.,
Philadelphia, PA 19086

Ismail, Zakya 3 m
Rice University, P.O. Box 1892
Houston, TX 77251

Olander, Donald 219 ek
University of Berkeley, California
Nuclear Engineering
Berkeley, CA 94720

2. Every effort should be made to avoid scheduling the High Temperature Chemistry Conference on the same date as the conference on: Solid State Chemistry, Crystal Growth, Solid State Studies in Ceramics, Molecular Electronic Spectroscopy, Plasma Chemistry.
3. The poster sessions should be continued with the following changes:
 - a) Display the posters at a time and place more convenient to the participants. For example, display the posters in the dining or snack bar area and hold the sessions from 5:30 - 6:30 P.M.
 - b) Display only about 8 posters each day and do not leave the posters up for a second day.
 - c) Explore the possibility of allowing each poster presenter two minutes (one or two slides or transparencies) to present the title and a brief abstract of the poster at a time preceding each poster session.
4. Recommended topics for 1984, were presented and distributed to the conferees to assess their interest. (The list is attached to these minutes.

The Chairman express his thanks to Vice Chairman Karl Spear for his work in organizing and planning the poster sessions. Chairman-Elect Spear then expressed his thanks to Chairman Worrell for his efforts. He announced that the 1984 Gordon Research Conference on High Temperature Chemistry will be July 23-27, 1984, at Brewster Academy in Wolfeboro, N. H.

The meeting was adjourned at 12:25 P.M.

Respectfully submitted,

Clifford E. Myers,
Secretary

Gordon Research Conference on

High Temperature Chemistry

Tilton School
Tilton, New Hampshire

July 26-30, 1982

Minutes at the Business Meeting

The business meeting of the conference was called to order by the Chairman, Wayne Worrell, following the morning session on Thursday, July 29, 1982, at 11:45 A.M. He reported that there were 105 conferees (15 were from outside the U.S.) of which 20 were from industry, 30 from government, and 40 from universities. The last included 15 "young" scientists (graduate students and post-doctoral associates).

The Chairman expressed appreciation to the speakers and participants. He noted that the discussions had been vigorous and of high quality. He also expressed appreciation for the service of the projectionist.

Following the tradition of the conference, it was moved, seconded and carried that Karl Spear, the 1982 Vice Chairman, be elected Chairman of the 1984 Conference.

The Vice Nominating Committee which had been named on the first day of the conference, consisted of:

Gerd Rosenblatt, (Chairman), Leo Brewer, K. Douglas Carlson,
Daniel Cubicciotti, Paul Gilles, John Hastie, and Robert Thorn.

The committee's nominees for the post of Vice-Chairman for the 1984 conference were announced:

Donald Hildenbrand, SRI International
Bruce Wagner, Arizona State University

A secret ballot resulted in the election of D. Hildenbrand.

The Chairman called on Bruce Wagner for the report of the Recommendations Committee. Committee members were:

Bruce Wagner (Chairman from Arizona State University), Clifton Draper (Western Electric Co.), Margaret Frisch (IBM), James Cole (Georgia Inst. Technol.), David Green (Argonne Natl. Lab.), Fred Kohl (NASA - Lewis), Charles Kolb (Aerodyne Res. Inc.), Alexandra Novrotsky (Arizona State Univ.), and Dean Peterson (Los Alamos Natl. Lab.).

The Committee made the following recommendations:

1. There should be a Gordon Research Conference on High temperature Chemistry in 1984.

TOPICS FOR 1984 CONFERENCE

PLEASE INDICATE YOUR PRIORITY OF INTEREST FOR EACH TOPIC:

H (High), M (moderate), L (Low).

Return by noon Friday 7/30/82 or mail to Karl Spear.

1. Role of inorganic species in combustion
2. Negative ions of high temperature species
3. Analytical and diagnostic techniques: e.g. electrochemical sensors
4. Properties and measurements at temperatures above 3000K
5. Gas-solid reactions: experiments and theory
6. Resonance Raman spectroscopy
7. Microwave spectroscopy
8. Photoelectron spectroscopy
9. Supersonic beams
10. Hot stage microscopy
11. High pressure-high temperature systems
12. Alkali metal applications in fusion, fission, MHD
13. Intermetallics: formation in epi-layers
14. Liquid phase and molecular beam epitaxy
15. Vaporization: non-stoichiometry, incongruent vaporization, unusual gaseous species
16. Materials processing in low gravity
17. Clusters: formation, experiments, theory
18. Electron diffraction
19. Model studies on condensed phase equilibria
20. Molecular reaction dynamics: experiment and theory
21. Coal slags: spectroscopic and other studies
22. High temperature gaseous solutions
23. Overview of chemical transport
24. Rare earth solids and vapors
25. Model calculations on condensed phase dynamics
26. High temperature disposal of organic waste
27. Evaluation and compilation of thermophysical data
28. Geological and astro physical processes
29. New and innovative methods for metals production
30. Cohesive energies of high temperature solids

ATTACHMENT E

Budget Breakdown for ORR Contribution

1982 GRC on High Temperature Chemistry

A. Conference Fixed Fee (\$230) Support for 10 Participants

1. P. J. Dagdigan, The Johns Hopkins University
2. J. Edwards, University of Toledo
3. G. C. Farrington, University of Pennsylvania
4. R. Hauge, Rice University
5. D. Levy, University of Chicago
6. A. Navrotsky, Arizona State University
7. P. C. Nordine, Yale University
8. K. E. Spear, Pennsylvania State University
9. M. Vala, University of Florida
10. H. Wiedemeir, Rensselaer Polytechnic Institute

\$2,300

B. Domestic Travel Support

- | | |
|--|---------------|
| 1. L. Brewer, University of California | \$ 230 |
| 2. P. Gillis, University of Kansas | 230 |
| 3. D. Levy, University of Chicago | 250 |
| | <u>\$ 700</u> |

Total \$3,000