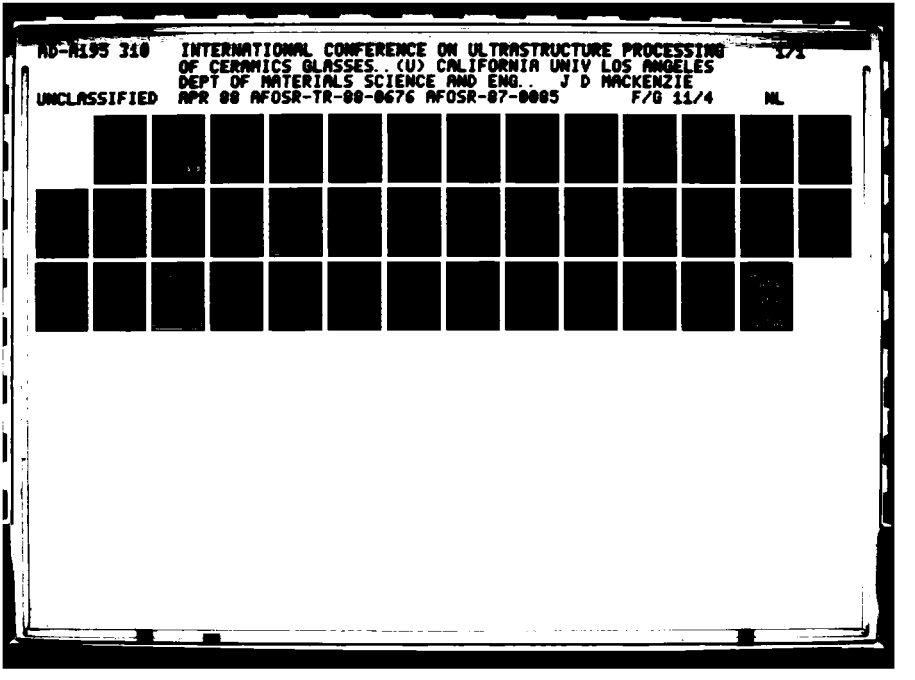
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DEPT OF MATERIALS SCIENCE AND ENG.. J D MACKENZIE
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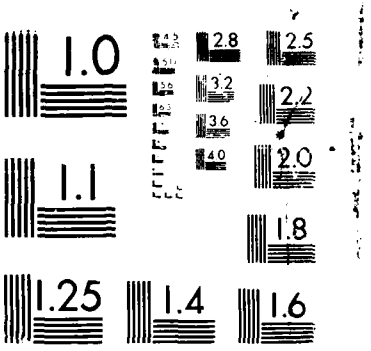

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An International Conference was organized and held on Feb 23-27, 1987 in San Diego, CA. The meeting was attended by 250 people from 11 countries. There were 60 oral presentations and 42 poster presentations. The Conference Proceedings will be published by John Wiley & Sons, New York in 1988

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COMPLETED PROJECT SUMMARY

TITLE: Third International Conference on Ultrastructure Processing of Ceramics, Glasses and Composites

PRINCIPAL INVESTIGATOR: Professor John D. Mackenzie
Department of Materials Science and Engineering
University of California
Los Angeles, CA 90024-1595

INCLUSIVE DATES: 01/01/87 to 12/31/87

CONTRACT/GRANT NUMBER: AFOSR-87-0085

SENIOR RESEARCH PERSONNEL: None

JUNIOR RESEARCH PERSONNEL: None

PUBLICATIONS:

"Ultrastructure Processing of Advanced Ceramics," edited by J.D. Mackenzie and D.R. Ulrich, John Wiley and Sons, New York, New York (1988).

ABSTRACT OF OBJECTIVES AND ACCOMPLISHMENTS:

1. The objectives for this Third Conference were similar to those of the two previous ones (Florida, 1983 and 1985), namely to establish and to strengthen the scientific foundation for a new era in the processing of ceramics, glasses and composites for electronic, optical, structural and novel applications. In the past few years, attempts to understand and to control the processing of these materials on a submicron and even molecular scale through direct interactions between chemists, materials scientists, engineers and physicists, made possible by the support of AFOSR and others, have already led to new materials, novel processes and improved properties. Further progress would be enhanced through the sharing of research results and ideas via this forthcoming Third Conference.

2. The Conference was successfully organized and took place at the San Diego Princess Resort in San Diego, California from February 23 to 27, 1987. Two-hundred and fifty people attended. There were 60 oral presentations and 42 poster presentations. The conference proceedings will be published in the form of a book entitled "Ultrastructure Processing of Advanced Ceramics," edited by J.D. Mackenzie and D.R. Ulrich, in June, 1988.

UNIVERSITY OF CALIFORNIA, LOS ANGELES
SCHOOL OF ENGINEERING AND APPLIED SCIENCE
LOS ANGELES, CALIFORNIA 90024-1595

Final Technical Report

to

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

on project

Third International Conference on Ultrastructure Processing of Ceramics, Glasses and Composites

Grant No.: AFOSR 87-0085

Inclusive Dates:

1 January 1987 to 31 December 1987

Principal Investigator

J.D. Mackenzie
Professor of Engineering and Applied

April, 1988

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ABSTRACT

The Third International Conference on Ultrastructure Processing of Ceramics, Glasses, and Composites was successfully organized and held in San Diego, California from February 23 to 27, 1987. There were 250 attendees from eleven countries. There were 60 oral presentations and 42 poster presentations on all aspects of ultrastructure processing. The Conference Proceedings will be published by John Wiley and Sons, New York, in the form of a book entitled "Ultrastructure Processing of Advanced Ceramics," edited by J.D. Mackenzie and D.R. Ulrich, in June, 1988. The book will contain 83 articles and will be in excess of 1,000 printed pages.

TABLE OF CONTENTS

1. Introduction

During the past decade, interests in the processing of ceramics have been shifting from the micron-scale to the submicron scale of powders. Simultaneously there has been a growing interest n the sol-gel process to produce glasses. In addition, the use of metal-organic compounds as precursors has been successful in the preparation of silicon carbide fibers. The concept of controlling processesat almost the molecular scale to produce new ceramics, glasses and composites led the University of Florida to organize the First International Conference on Ultrastructure Processing in February, 1983. The Conference with Professor L.L. Hench of the University of Florida and Dr. D.L. Ulrich of the Air Force Office of Scientific Research as Co-Chairmen and sponsored by the Directorate of Chemical and Atmospheric Science of AFOSR, was an immediate success. More than 200 scientists from the disciplines of materials science, ceramics, polymer, chemistry, physics and mechanics were able to learn from one another. The Conference also resulted in the publication of a very valuable book by John Wiley and Sons in 1984. The success of the First Conference prompted Professor Hench and Dr. Ulrich to organize the Second International Conference on Ultrastructure Processing in February, 1985. The Second Conference attracted an even larger number of participants. Again it was a clear success and the proceedings will again be published by John Wiley and Sons in 1986. These two international meetings have permitted scientists from different disciplines to explore new ideas together not only in fundamental research but in applications as well. The demonstrated success and the high probability that more innovations will be developed as a result of this type of meeting demanded that a Third International Conference be organized for 1987.

A proposal was thus submitted to the Air Force Office of Scientific Research to support a Third Conference to be sponsored by the Department of Materials Science and Engineering, University of California, Los Angeles. The proposal was approved and the Conference was subsequently held in San Diego, California, from February 23-27, 1987.

2. Conference Objectives and Plans

The objectives for this Third Conference was similar to those of the two previous ones (Florida, 1983 and 1985), namely to establish and to strengthen the scientific foundation for a new era in the processing of ceramics, glasses and composites for electronic, optical, structural and novel applications. In the past few years, attempts to understand and to control the processing of these materials on a submicron and even molecular scale through direct interactions between chemists, materials scientists, engineers and physicists, made possible by the support of AFOSR and others, have already led to new materials, novel processes and improved properties. Further progress would be enhanced through the sharing of research results and ideas via this Third Conference.

The plan of the Conference was to bring together leading researchers from different disciplines who were involved in understanding the processing of ceramics, glasses and composites on a submicron level and how to control the microstructure and properties of such materials. Most speakers would be by invitation. Contributed papers would be accepted based upon review of the abstracts submitted. Posters would also be accepted and new research especially welcome. A Conference Proceedings would be published probably again by John Wiley and Sons. The following topics would be covered:

- Sol-gel processes and processing
- Ultrafine powder processing
- Applications of ultrastructure processing
- Chemical precursors for ultrastructure processing
- Relation between ultrastrucures and properties of solids
- Ultrastructures in macromolecular materials
- Theoretical aspects of ultrastructure development

3. Organization and Location

The co-chairmen was Professor J.D. Mackenzie (UCLA) and Dr. Donald R. Ulrich (AFOSR). The faculty of the Department of Materials Science and Engineering of UCLA voted to sponsor the Conference. Because of the unavailability of meeting facilities on campus, the San Diego Princess Report at San Diego was selected to be the Conference site. A copy of the Preliminary Announcement sent out to over a thousand people is attached in the Appendix. A copy of the Second Announcement sent out in late 1986 is also attached. The Conference was successfully held from February 23-27, 1987.

4. Program

Because of excessive demand, the times were extended each day to accommodate all the oral presentations. Professor W.D. Kingery (MIT) was the Keynote Speaker on February 24 and presented a 50 minute address on "History of Ceramic Processing." There was a total of 60 oral presentations and 42 Poster presentations. A copy of the official program listing speakers and title of papers is attached in the Appendix. After dinner on

February 25, Dr. J.O. Dimmock, Technical Director of AFOSR gave an address entitled, "The Role of Air Force Basic Research."

In addition to Professor Kingery, the following distinguished scientists were invited speakers:

From the U.S.A. - I.A. Aksay (University of Washington), H.R. Allcock (Penn State), H.K. Bowen (MIT), D.E. Clark (Univ. of Washington), M.F. Hawthorne (UCLA), L.L. Hench (Univ. of Florida), LV. Interrante (RPI), J. Jonas (Univ. of Illinois), F.F. Lange (Rockwell International), J.D. Mackenzie (UCLA), J.E. McGrath (VPI), P. K. McCrone (RPI), E. Matijevic (Clarkson), R. Roy (Penn State), G.W. Scherer (DuPont), D. Seyferth (MIT), N.J. Turro (Columbia Univ.), D.R. Uhlmann (Univ. of Arizona), J.L. White (Aerospace Corp.)

From Overseas - R. Corriu (France), L. Cot (France), J. Fricke (West Germany), J. Livage (France), K. Okamura (Japan), S. Sakka (Japan), H. Schmidt (West Germany), and J. Zarzycki (France).

5. Attendance

The original plan was to limit the number of attendees to 200 people. However, excessive demands from industry and university to present poster papers and to attend the Conference persuaded the Conference Co-Chairmen to extend the attendance. Subsequently, 250 people attended, with participants from 11 countries. A copy of the Registration List is attached in the Appendix.

6. Conference Proceedings

A great majority of the papers presented were submitted for publication. The papers were all reviewed by selected experts. The Conference Proceedings will be published by John

Wiley and Sons, Inc., New York, as a book entitled "Ultrastructure Processing of Advanced Ceramics," edited by J.D. Mackenzie and D.R. Ulrich. The book will be in print by June, 1988 and will have 82 chapters plus the article by Professor W.D. Kingery.

A P P E N D I X

PRELIMINARY ANNOUNCEMENT
and
CALL FOR PAPERS

THIRD INTERNATIONAL CONFERENCE on ULTRASTRUCTURE PROCESSING OF CERAMICS GLASSES AND COMPOSITES

FEBRUARY 23-27, 1987
CATAMARAN RESORT HOTEL
SAN DIEGO, CALIFORNIA

Sponsored by:
University of California, Los Angeles
Department of Materials Science and Engineering

Supported by*:
Directorate of Chemical and Atmospheric Sciences
U.S. Air Force of Scientific Research

*Support pending

To: Professor J.D. Mackenzie
(Ultrastructure Processing)
University of California
Department of Materials Science and Engineering
Boelter Hall 6531
Hilgard Avenue
Los Angeles, CA 90024
U.S.A

CONFERENCE OBJECTIVES

The objectives of this Third Conference are similar to those of the two previous ones (Florida, 1983 and 1985), namely to establish and to strengthen the scientific foundation for a new era in the processing of ceramics, glasses and composites for electronic, optical, structural and novel applications. In the past few years, attempts to understand and to control the processing of these materials on a submicron and even molecular scale through direct interactions between chemists, materials scientists, engineers and physicists, made possible by the support of AFOSR and others, have already led to new materials, novel processes and improved properties. Further progress will be enhanced through the sharing of research results and ideas via this forthcoming Third Conference.

CONFERENCE PLAN

To bring together leading researchers from different disciplines who are involved in understanding the processing of ceramics, glasses and composites on a submicron level and how to control the mircrostructure and properties of such materials. Most speakers will be by invitation. Contributed papers will be accepted based upon review of the abstracts submitted. Posters will also be accepted and new research especially welcome. A Conference Proceedings will be published. The following topics will be covered:

* *Sol-Gel processes and processing*
* *Ultrafine powder processing*
* *Applications of ultrastructure processing*
* *Chemical precursors for ultrastructure processing*
* *Relation between ultrastructures and properties of solids*
* *Ultrastructures in macromolecular materials*
* *Theoretical aspects of ultrastructure development*

ORGANIZATIONS

The co-chairman will be Professor J.D. Mackenzie (University of California) and Dr. D.R. Ulrich (AFOSR) who will also be the co-editors of the Conference proceedings.

LOCATION AND ARRANGEMENTS

The conference will be held at the Catamaran Resort Hotel in San Diego, California, U.S.A. The hotel has its own beach on Mission Bay and is 5 miles from San Diego International Airport. San Diego, renowned for its mild year-round climate, Sea World, Zoo, shops, restaurants and sporting facilities, is ten miles from the Mexican border and 100 miles from Los Angeles. A block of rooms has been reserved at the hotel at $64/night for single and $68/night for double or twin occupancies. Although no program is presently planned for accompanying persons, sight-seeing and other activities can be arranged through the hotel.

PAPERS and ABSTRACTS

Authors wishing to contribute a paper will be required to submit a short abstract (no more than 100 words) no later than September 1, 1986. These will be used as a basis for judging acceptance. A manuscript must be made available for inclusion in the proceedings no later than February 23, 1987. Those unable to meet the above deadlines may wish to present their recent research at the poster sessions planned.

Those interested in this meeting should return the attached tear-out form or contact J.D. Mackenzie at **(213) 825-3539.**

TO: J.D. MACKENZIE, Ultrastructure Processing Conference

Name: _____

Organization: _____

Address: _____

_____

_____

Telephone: _____

___ Please send me the next circular

___ I am interested in attending

___ I may be accompanied by a non-conference attendee

___ I plan to submit a paper

Tentative Title of Paper _____

_____

_____

SECOND ANNOUNCEMENT
and
LAST CALL FOR PAPERS

THIRD INTERNATIONAL CONFERENCE on ULTRASTRUCTURE PROCESSING OF CERAMICS GLASSES AND COMPOSITES

FEBRUARY 23-27, 1987
VACATION VILLAGE RESORT
SAN DIEGO, CALIFORNIA

Sponsored by:
University of California, Los Angeles
Department of Materials Science and Engineering

Supported by*:
Directorate of Chemical and Atmospheric Sciences
U.S. Air Force or Scientific Research

*Support pending

CONFERENCE OBJECTIVES

The objectives of this Third Conference are similar to those of the two previous ones (Florida, 1983 and 1985), namely to establish and to strengthen the scientific foundation for a new era in the processing of ceramics, glasses and composites for electronic, optical, structural and novel applications. In the past few years, attempts to understand and to control the processing of these materials on a submicron and even molecular scale through direct interactions between chemists, materials scientists, engineers and physicists, made possible by the support of AFOSR and others, have already led to new materials, novel processes and improved properties. Further progress will be enhanced through the sharing of research results and ideas via this forthcoming Third Conference.

CONFERENCE PLAN

To bring together leading researchers from different disciplines who are involved in understanding the processing of ceramics, glasses and composites on a submicron level and how to control the mircrostructure and properties of such materials. Most speakers will be by invitation. Contributed papers will be accepted based upon review of the abstracts submitted. Posters will also be accepted and new research especially welcome. A Conference Proceedings will be published. The following topics will be covered:

* *Sol-Gel processes and processing*
* *Ultrafine powder processing*
* *Applications of ultrastructure processing*
* *Chemical precursors for ultrastructure processing*
* *Relation between ultrastructures and properties of solids*
* *Ultrastructures in macromolecular materials*
* *Theoretical aspects of ultrastructure development*

ORGANIZATIONS

The co-chairman will be Professor J.D. Mackenzie (University of California) and Dr. D.R. Ulrich (AFOSR) who will also be the co-editors of the Conference proceedings.

LOCATION AND ARRANGEMENTS

The conference will now be held at the Vacation Village Resort in San Diego. The hotel has its own beach on Mission Bay and is 5 miles from San Diego International Airport. San Diego, renowned for its mild year-round climate, Sea World, Zoo, shops, restaurants and sporting facilities, is 10 miles from the Mexican border and 100 miles from Los Angeles. A block of rooms has been reserved at the hotel at $70/night for single or double occupancies. Most of the rooms have two beds. Many sightseeing trips and visits to tourist attractions can be arranged through the hotel.

HOTEL RESERVATIONS

Please use the enclosed envelope for hotel reservation. The envelope and one night's deposit must reach the hotel by January 22. Reservations received after that date will be on a space available basis. The cheap rate of $70 per room is also applicable for the week-ends immediately before and after the conference. Suites cost from $130/night, have kitchenettes and are suitable for families.

CONFERENCE REGISTRATION

The prepaid cost of participation will be $230 per attendee. This fee includes a copy of the proceedings, abstract of papers, 2 dinners, 4 luncheons, 1 reception and refreshments at the meeting. Non-attending guests may purchase meal tickets. The enclosed Registration Form and full payment should reach Professor J. D. Mackenzie no later than January 22. Refund will be made if cancellation request is received by February 16. Registration fee at the Conference will be $260 per attendee.

PAPERS AND ABSTRACTS

Authors wishing to contribute a paper will be required to submit a 100 words abstract no later than October 15. This will be used as a basis for judging acceptance. A manuscript must be made available for inclusion in the proceedings no later than February 23, 1987. Those unable to meet the deadline may wish to present their recent research at the poster session.

TENTATIVE PROGRAM

A reception will be held on Monday evening, February 23. Technical sessions will be held on Tuesday a.m. and p.m., Wednesday a.m., Thursday a.m. and p.m. and Friday a.m. Wednesday afternoon will be left free for personal discussions and/or relaxation. A poster session will be held.

Professor W. D. Kingery of M.I.T. will present a keynote lecture entitled "History of Ceramics Processing". Other speakers will include:

From the U.S.A. — I. A. Aksay, H. R. Allcock, H. K. Bowen, C. J. Brinker, D. E. Clark, L. L. Hench, J. Jonas, F. F. Lange, J. D. Mackenzie, J. E. McGrath, R. K. McCrone, E. Matijevic, E. M. Rabinovich, R. Roy, G. W. Scherer, D. Seyferth, N. J. Turro, D. R. Uhlmann, J. L. White.

From Overseas — L. Cot (France), J. Fricke (W. Germany), J.Livage (France), K. Okamura (Japan), H. W. Rosenburg (U. K.), S. Sakka (Japan), H. Schmidt (W. Germany), and J. Zarzycki (France).

Further information can be obtained from Professor J. D. Mackenzie at the address shown or at (213) 825-3539.

Registration List

Third International Conference On Ultrastructure Processing Of Ceramics, Glasses And Composites

SAN DIEGO PRINCESS
San Diego, California
February 23-27, 1987

Sponsored by :
University of California, Los Angeles
Department of Materials Science and Engineering

Supported by:
Directorate of Chemical and Atmospheric Sciences
U. S. Air Force Office of Scientific Research

UCLA/Department of Materials Science and Engineering

6532 - Boelter Hall
School of Engineering and Applied Science
University of California, Los Angeles

PARTICIPANTS

Barbara V. Brooks

Abdelkerim Chemseddine

K.C. Chen

Young J. Chung

Mary W. Colby

Jong Heo

Ashok Janah

Azar Nazeri-Eshghi

Ed J.A. Pope

Jas S. Sanghera

Joan M. Scheible

Aki Sugitani

Ting Yuen

Rafeal Zaldivar

ALLCOCK, Harry R.
Pennsylvania State Univ
Dept. of Chemistry
152 Davey Lab
University Park, PA 16802

AKSAY, Ilhan A.
Dept of Materials Science and Engr.
Roberts Hall
University of Washington
Seattle, Washington 98195

ASAMI, Muneo
Chisso Corporation
1-1 Noguchi-cho, Minamata
Kumamoto 867, JAPAN

BALL, Donald L.
AFOSR
Bolling Air Force Base
Washington, D.C. 20332-6448

BARCLAY, David A.
Vista Chemical Co
P O Box 500
Ponca City, Oklahoma 74602

BASIL, John D.
PPG Industries
P O Box 11472
Pittsburgh, PA 15238

BERNIER, Jean C.
E.H.I.C.S.
Dept Science des Materiaux
1 Rue Blaise Pascal 67008
Strasbourg Cedex, FRANCE

BESENBRUCH, Gottfried
GA Technologies, Inc.
P O Box 85608
San Diego, CA 92138

BLOCK, Jacob
W.R. Grace & Co
7379 Route 32
Columbia, Maryland 21044

BLUM, Yigal D.
SRI International
333 Ravenwood Ave
Menlo Park, CA 94025

BOND, Walter D.
Oak Ridge National Lab
Bldg 7920, MS-384
P O Box X
Oak Ridge, TN 37831-6384

BORDEN, Michael R.
The Perkin-Elmer Corporation
100 Wooster Heights Road
Danbury, CT 06810

BORENDT, Joseph
UCLA
Dept of Chemistry
3034 Young Hall
Campus

BOWEN, Kent H.
Dept of Materials Science and Engr.
Massachusetts Institute of Technology
Cambridge, MA 02139

BOYCE, Scott D.
PQ Corporation
280 Cedar Grove Road
Lafayette Hill, PA 19444

BRINKER, Jeffrey C.
Sandia National Lab
Division 1846
Albuquerque, New Mexico 87185-5800

BUCKLEY, Alan
Celanese Research Co.
86 Morris Ave
Summit, New Jersey 07901

BUTTON, Daniel P.
E.I. du Pont de Nemours & Co., Inc.
Experimental Station, Bldg. 262
Wilmington, DE 19898

BYERS, Charles H.
Oak Ridge National Lab
P O Box X
Bldg 4501, MS-224
Oak Ridge, TN 37831-6224

CAMPBELL, Candace
Gel-Tech, Inc.
One Progress Blvd
#18

Alachua, Florida 32615

CAMPERO, A.
Univ. Autonoma Metropolitana
Ap. Postal 55-534
09340 Mexico City, Mexico

CANNON, Roger W.
Dept of Ceramics
P O Box 909
Rutgers Univ.
Piscataway, New Jersey 08855-0909

CAPS, Roland
Physikal Institut
Universitat Wurzburg
Wurzburg, GERMANY

CARTIER, George E.
Monsanto Co
730 Worcester St
Springfield, MA 01151

CHE, Tessie M.
Celanese Research Co
86 Morris Ave
Summit, New Jersey 07090

CHOWDHRY, Uma
E.I. du Pont de Nemours & Co.
R&D Department
Experimental Station, E356/159
Wilmington, DE 19898

CHU, T.
UCLA
Dept of Materials Sci and Engr.
6531 - Boelter Hall
Campus

CLARK, D.E.
Dept of Materials Science and Engr.
University of Florida
Gainesville, Florida 32611

CORRIU, R.
Institute de Chimie Fine
Univ. des Sciences et Techniques
du Languedoc
Laboratoire de Chimie des Organometalliques
34060 Montpellier, Cedex, FRANCE

COT, L.
Lab. de Physicochimie des Materiaux
8, Rue de L'Ecole Normale
34075 Montpellier, Cedex, FRANCE

COVINO, J.
Naval Weapon Weapons Center
Research Dept
China Lake, CA 93555

CROWSOM, Andrew
Army Research Office
P O Box 12211
Research Triangle Pk, NC 27709

DALE, George
Massachusetts Institute of Technology
Room 13-4069
Cambridge, MA 02139

DAMRAUER, R.
Chemistry Department
University of Colorado
1100 14th St
Denver, Colroado 80202

DANFORTH, Stephen C.
Dept of Ceramics
Rutgers University
P O Box 350
Piscataway, New Jersey 08854

DAVIS, Larry P.
Air Force Scientific Office
Bolling Air Force Base
Washington, D.C. 20332

DAWSON, Bill
Battelle Columbus Division
505 King Ave
Columbus, Ohio 43201-2693

DECKER, L.B.
Vista Chemical Co
P O Box 500
Ponca City, Oklahoma 74602

DIMMMOCK, John O.
Air Force Office of Scientific Research
Bolling Air Force Base
Washington, D.C. 20322-6448

DINH, Steve
E.I. du Pont de Nemours & Co.
E302 Experimental Station
Wilmington, DE 19898

DOLTON, L.
Dept of Chemistry
University of Southern California
Los Angeles, CA 90089-0482

DOYLE, William F.
Rogers Corporation
One Technology Drive
Roers, CT 06263

EICHORST, Dennis J.
Dept of Ceramic Engr.
University of Illinois
105 S. Goodwin Ave
Urbana, Illinois 61801

EVERITT, George F.
3M Company
3M Center, 219-01-01
St. Paul, Minnesota 85514

FABES, Brian D.
Massachusetts Institute of Technology
Rm 13-4096
Cambridge, MA 02139

FELLMANN, J.
Catalytica Associates
430 Ferguson Dr,
Bldg. 3
Mountain View, CA 94035

FELLOWS, B.T.
3M Company
3M Center, Bldg 209 BW-10
St. Paul, Minnesota 55144-1000

FISH, John G.
Texas instruments, Inc.
P O Box 655935, MS 145
Dallas, Texas 75265

FRANZ, Helmut
PPG Industries
P O Box 11472
Pittsburgh, PA 15283

GALLO, Tom
4 Stonegate Drive
Mt. Holly, New Jersey 08060

GENSSE, Chantal
E.I. du Pont de Nemours & Co., Inc.
Experimental Station, Bldg 356
Wilmington, DE 19898

GERK, A.P.
Abex Corporation, Research Center
65 Valley Road
Mahwah, New Jersey 07430

GIANNELIS, Emmanuel P.
Dept of Chemistry
Michigan State University
East Lansing, Michigan 48824

GOLDFARB, Ivan
Air Force Materials Lab
AFWAL/MLBP
Wright-Patterson Air Force Base
Ohio 45433

GORDON, Mark S.
North Dakota University
Department of Chemistry
Fargo, North Dakota 58105

GORSUCH, Donald R., Director
Tech & New Business Development
1 New Bond St
Worcester, MA 01601

GUGLIELMI, M.
1st Chemica Industriale University
Degli Studi Padova, via F. Marzolo 9
35100 Padova, ITALY

GUENTHER, Arthur
Air Force Weapons Lab
Kirkland Air Force Base, NW 87117

HARDMAN-Rhyne, K.A.
NBS
Ceramics Division
Gaithersburgh, Maryland 20899

HARRIS, Daniel C.
Naval Weapons Center
Code 3854

China Lake, CA 93555

HARRIS, Norman H.
Hughes Aircraft Co
P O Box 902, E1/F150
El Segundo, CA 90245

HAWTHORNE, Frederic M.
UCLA
Dept of Chemistry
3039 Young Hall
Campus

HENCH, Larry L.
University of Florida
One Progress Blvd
#14
Alachua, FL 32615

HERSH, Leroy
Corning Glass Works
SP-Fr-6-1
Corning, New York 14831

HOENES, Gregory S.
VISTA Chemical Co
15990 N. Barkers Landing
Houston, Texas 77224

HURWITZ, France
NASA Lewis Research Center
MS 106-1, 21000 Broak Park Rd
Cleveland, Ohio 44135

INTERRANTE, L.V.
RPI
Dept of Chemistry
Troy, New York 12180-3590

JADA, Sivananda S.
Manville R&D Center
P O Box 5108, MS R-27
Denver, Colorado 80217

JONAS, J.
Dept of Chemistry
School of Chemical Sciences
University of Illinois
Urbana, Illinois 61801

JONES, David C.
Radian Ceramic Development Co
P O Box 9948-8501
Austin, Texas 78766

KAAE, James L.
GA Technologies, Inc.
P O Box 85608
San Diego, CA 92138

KANAI, Tsuneyuki
Massachusetts Institute of Technology
Rm. 12-022
Cambridge, MA 02139

KANNER, Bernad
5 Robin Lane
West Nyack, New York 10994

KELTS, Larry W.
Eastman Kodak Co, CRL
Rochester, New York 14650

KIM, Byong-Ho
Dept of Materials Science
Korea University
1, Anam-dong, Sunbuk-Ku
Seoul, KOREA 132

KINGERY, W.D.
Massachusetts Institute of Technology
13-4090
Cambridge, MA 02739

KINSELLA, Timothy F.
ABEX CORP
65 Ramapo Valley Road
Mahawash, New Jersey 07430-1661

KIRBY, Kevin W.
Hughes Aircraft Co
Malibu Research Lab
3011 Malibu Canyon road
Malibu, CA 90265

KLEIN, L.C.
Ceramics Dept
Rutgers Univ
P O Box 909
Piscataway, New Jersey 08854

KNOBBE, Ed
UCLA

Dept of Materials Science and Engr
6531 - Boelter Hall
CAMPUS

KOVAR, Robert F.
Foster-Miller, Inc.
350 Second Avenue
Waltham, MA 02254

KRATZER, Reinhold H.
Ultra Systems, Inc.
Von Karman Ave
Irvine, Ca 92714

LANDERS, Albert G.
Armstrong World Ind.
2500 Columbia Ave
Lancaster, PA 17604

LAL, Misri
MEPCO Centralab Inc.
4561 Colorado Blvd
Los Angeles, CA 90039

LANDHAM, Rowena
Alcan Intl, Ltd Energy Lab.
Banbury, Oxon
OX 16, 7SP ENGLAND

LANGE, Fred
Materials Dept
University of California
Engineering II, Rm 1347
Santa Barbara, CA 93106

LELENTAL, Mark
Eastman Kodak Co Research Lab
Rochester, New York 14650

LILLEY, E.
North Co
H.P.C. Goddard Road
Northboro, MA 01532-1545

LIN, Chia-Cheng
PPG Industries
P O Box 11472
Pittsburgh, PA 15238-0472

LIPELES, Russell A.
The Aerospace Corporation
P O Box 92957, MS M2-272
Los Angeles, CA 90009

LIVAGE, J.
Spectrochimie du Solide
Universite Pierre et Marie Curie
4 Place Jussieu
75230 Paris Cedex 05
Tour 44-2e etage, FRANCE

LOZOWSKI, Dorothy
Stauffer Chemical Co
Eastern Research Center
Dobbs Ferry, New Jersey 10522

LU, Paul
Dow Corning Corp
Midland, Michigan 48640

LUSIGNEA, Richard W
Foster-Miller, inc.
350 Second Avewaltham, MA 02154-1196

McCANDLISH, Larry E.
Exxon Research and Engr. Co
25 Harrison Ave
Highland Park, New Jersey 08904

MACCROME, R.K.
4 Loudon height N
Loudonville, New York 1211

MACKENZIE, John D.
UCLA
Dept of Materials Science and Engr.
6531 - Boelter Hall
Campus

MAH, Tai-Il
Universal Energy Systems, Inc.
4401 Dayton-Xenia Road
Dayton, Ohio 45432-1894

MAHLO, Edwin K.
Business Consultant
180 Parker St
East Longmeadown, MA 01028

MARK, J.E.
Dept of Chemistry, ML #172
University of Cincinnati
Cincinnati, Ohio 4522i

MATIJEVIC, E.
Clarkson University
Potsdam, New York 13676

MATUSEKO, Anthony
AFOSR
Bldg. 410
Bolling Air Force Base
Washington, D.C. 20332-6448

MAZDIYASNI, K.S.
GA Technologies, Inc.
P O Box 85608
San Diego, CA 92138-5608

MAZZORANA, Tom
Endevco
30700 Rancho Viejo Road
San Juan Capistrano, CA 92675

McGINNIS, James L.
Celanese Research Company
86 Morris Avenue
Summit, New Jersey 07901

McGRATH, J.E.
Dept of Chemistry/Polymers Matls
and Interface Lab
VPI
Blacksburgh, Virginia 24061

McMULLEN, Anne
Dept of Chemistry, D-006
University of California, San Diego
La jolla, CA 92093

McQUILLAN, Barry
GA Technologies, Inc.
P O Box 85608
San Diego, CA 92138

MECATNEY, Martha L.
Dept of Chemical Engr & Matls Sci.
University of Minnesota
421 Washington Ave., SE
Minneapolis, MN 55455

MELPOLDER, Sharon M.
Eastman Kodak Company
Corporate Research Lab.
Rochester, New York 14650

MODUGNO, S.A.
AT&T Bell
Murray Hill, New Jersey 07974

MURKERJEE, S.P.
IBM
Bodle Hill Road
Owego, New York 13827

NATANSOHN, Sam
GTE Lab., Inc.
40 Sylvan Road
Waltham, MA 02254

NIIHAN, K.
The National Defence Academy
Physics Dept
1-10-20, Hashirimizu
Yokosuka 239, JAPAN

NOTIS, Michael R.
Lehigh University
452 Whitaker Lab
Bethlehem, PA 18015

NOZOYE, M.
National Chemical Lab
for Industry
Tsukuba, IBaraki, 305 JAPAN

OHMER, Melvin C.
Air Force Aeronautical Labs
Wright Patternson Air Force Base,
Ohio 45433-6533

OKAMURA, Kiyohito
Tohoku University
The Oarai Branch, RIISOM
Marita, Oatri-machi
Ibaraki-Ken, 311-13, JAPAN

OLSON, W.
Engineering Materials Res Center
Allied Signal
50 East Algoniquin Road
Des Plaines, Illinois 60017-5016

ORCEL, Gerard
Gel-Tech, Inc.
One Progress Blvd
#18

Alachua, Florida 32615

PACIOREK, Kazimiera L.
Ultrasystems, Inc.
16845 Von Karman Ave
Irvine, CA 92714

PANTANO, Carlo
Pennsylvania State University
123 Steidle Bldg
University Park, PA 16802

PATCHETT, Joseph E.
Norton Research
8001 Daly St
Niagara Falls, Ontario
L2S 6S2, CANADA

PAZPUSALT, Gustavo
Eastman Kodak Corp
1999 Lake Ave
Rocheser, New York 14650

PETERSON, David
P O Box 551
Dept 72-75
Burbank, CA 91520

POUXVIEL, J.C.
Ecole Polytechnique
Pabo P.M.C., Groupe de Himie du Solide
Route de Saclay
91128 Palaiseau, FRANCE

QI, Dongxin
Dept of Matls Sci and Engr.
Pennsylvania State University
Box 26, 214 Steidle Bldg
University Park, PA 16802

QUINN, Rod K.
Chemical and Laser Science
Los Alamos National Lab
P O Box 1663/MS J563
Los Alamos, New Mexico 55144-1000

RABINOVICH, Eliezer M.
AT&T Bell Lab
600 Mountain Avenue, Rm 7A-313
Murray Hill, New Jersey 07974

RAKES, Gary
Eastman Kodak Co
Kodak Apparatus Division
901 Elmgrove Road (D1/44, 5-5-HE)
Rochester, New York 14650

RAMASUAMY, R.V.
University of Florida
Larsen Hall, Rm 137
Gainsville, Florida 32611

RAO, Srinivasa A.
Rutgers University
P O Box 909
Piscataway, New Jersey 08854

REHSPRINGER, Jean L.
E.H.I.C.S
Dept Science des Materiaux
1 Rue Blaise Pascal 67008
Strasbourg, Cedex, FRANCE

RHINE, Wendell E.
Massachusetts Institute of Technology
29 Crescent Road
Belmont, Massachusestts 02178

RIMAN, Richard E.
Dept of Ceramics
Rutgers University
Box 909
Piscataway, New Jersey 08854

RING, Morey A.
Dept of Chemistry
San Diego University
San Diego, CA 92182

ROBINSON, Arther
Science Magazine
1333 "H" St., N.W.
Washington, D.C. 29995

ROY, R.
Materials Research Laboratory
Pennsylvania State University
University Park, PA 16802

RUSSEL, Christian
Institut fur Werkstottwissuschaften III
Universitat Erlangen
Martensstr 5, Germany

SAFARI, Ahmad
Rutgers University
P O Box 909
Piscataway, New Jersey 08854

SAKKA, Sumio
Institute for Chemical Research
Kyoto University
Uji, Kyoto-Fu 611,
JAPAN

SANCHEZ, C.
Spectrochimie du Solide
Univ. Pierre et Marie Curie
4 Place jussieu
75230 Paris, FRANCE

SAXTON, Robert J.
Catalytica Assoc.
430 Ferguson Drive, Bldg 3
Mountain View, CA 94043

SCHEINER, Paul
Constr. Prod. Div.
W.R. Grace 7 Co
62 Whittemore Avenue
Cambridge, MA 02140

SCHERER, George W.
E.I. du Pont de Nemours & Co.
R&D Dept
Experimental Station 356/384
Wilmington, DE 19898

SCHMIDT, Helmut
Fraunhofer-Institut fur Silicatforschung
Neunerplatz 2, D-8700
Wurzburg, FRG

SMITH, Lyrell
EDARD
Box 14
FPO
New York, New York 09510-0200

SCHUBERT, David
UCLA
Dept of Chemistry
3034 Young Hall
Campus

SCHWABEL, Mark G.
3M Company
3M Center
251-1A-03
St. Pal Minnesota 55144

SCHWARTZ, Kenneth
SRI International
333 Ravenswood Avenue
Menlo Park, CA 94025

SCHWARTZ, Robert W.
Dept of Ceramic Engineering
University of Illinois
105 S. Goodwin Ave
Urbana, Illinois 61801

SELWITZ, Charles
Getty Conservation Institute
3631 Surfwood Road
Malibu, CA 90265

SEYFERTH, Dietman
Dept of Chemistry
Massachusetts Institute of Technology
Cambridge, MA 02139

SHANNON, Robert D.
E.I. du Pont de Nemours
R&D Dept
Experimental Station 356/329
Wilmington, DE 19898

SHEPHERD, William H.
Kaysalis Corp
4200 Osuna, N.E.
Suite 102 (Box 106)
Albuquerque, New Mexico 87109

SHEU, Rong S.
Gel-Tech, Inc.
P O Box 12453
Gainsville, Florida 32604

SHOUP, Robert D.
Corning Glass Works
SP-FR-5-1
Corning, New york 14830

SIMMONS, Catherine J.
University of Florida, AMRC
One Progress Blvd, #11
Alachua, Florida 32615

SIMMONS, Joseph H.
Dept of Materials Science
University of Florida
154 Rhines Hall
Gainesville, Florida 32611

SINCLAIR, Robert A.
3M Company
201-26-1, 3M Center
St. Paul, Minnesota 55144

SPEECE, Dana
Aerospace Corporation
P O Box 92957, MS 2-321
Los Angeles, CA 90009

STRECKERT, Hal
GA Technologies, inc.
P O Box 85608
San Diego, CA 92138

SU, Sophia R.
GTE Laboratories, Inc.
40 Sylvan Road
Waltham, MA 12254

SWITZER, Jay A.
Dept of Materials Science and Engr.
University of Pittsburgh
848 Benedum Hall
Pittsburgh, PA 15261

TAKEUCHI, Hiroyuki
Chisso Corporation
1-1, Noguchi-cho, Minamata
Kumamoto, 867 JAPAN

TATEYAMA, H.
Government Industrial Research
Institute, Kyushu
Shuk Machi, Tosu City
Saga Prefecture 841, JAPAN

TILLEY, T.D.
Dept of Chemistry, D-006
University of California, San Diego
La Jolla, CA 92093

TREACY, D.J.
GA Technologies, Inc.
P O Box 85608
San Diego, cA 92138-5608

TRESTER, Paul D.
GA Technologies, Inc.
P O Box 85608
San Diego, CA 92138

TURRO, Nicholas J.
Dept of Chemistry
Columbia University
Box 610, Havenmeyer Hall
New York, New York 10027

UHLMANN, D.R.
Dept of Materials Science and Engr.
University of Arizona
Tucson, Arizona 85721

ULRICH, Donald R.
Air Force Office of Scientific Research
Bolling Air Force Base
Washington, D.C. 20322-6448

VIA, Frank A.
Stauffer Chemical Co
Livingstone Ave
Dobbs Ferry, New York 10522

WAKAI, Fumihiro
Government Industrial Research
Institute, Nagoya
1-1 Hirate-cho, Kita-ku
Nagoya 462, JAPAN

WALLACE, Stephen
AMRC
University of Florida
One progress Blvd, #14
Alachua, Florida 32615

WANG, Si-Ho
AMRC
University of Florida
One Progress Blvd, #14

Alachua, Florida 32615

WEBER, William P.
Dept of Chemistry
University of Southern California
Los Angeles, CA 90089-1661

WEINBERG, Michael
Jet Propulsion Lab
MS 125/112
Oak Grove Drive
Pasadena, CA 91108

WEST, Jon K.
AMRC
University of Florida
One Progress Blvd, #14
Alachua, Florida 32615

WHEELER, George
Metropolitan Museum of Art
Objects Conversation
Fifth Avenue at 82nd St
New York, New York 10028

WHITE, J.L.
Materials Science Lab
Aerospace Corporation
P O Box 92957
Los Angeles, CA 90009

WILSON, David M.
3M
Bldg. 201-4N-01, 3M Center
St. Paul, Minnesota 55144

WOOD, Thomas E.
3M Company
Bldg 201-4N-01, 3M Center
St. Paul, Minnesota 55144

WU, Edward T.H.
Rockwell International Science Center
Mail Code A20
1049 Camino Dos Rios
Thousand Oaks, CA 91360

YAMATO, Deanne
Lockheed-California Company
25115 Ave, Standard U-50B, Box 1
Valencia, CA 91355

YAMAMOTO, T.
Dept of Mathematics and Physics
National Defense Academy
Yokosuka 239, JAPAN

YASUMORI, Atsuo
Dept of Inorganic Materials
Tokyo Institute of Technology
1-12-1 O-Okayama, Meguro-ku
Tokyo, JAPAN

YOLDAS, Bulent E.
PPG Industries, Inc.
Glass RD
P O Box 11472
Pittsburgh, PA 15238

YU, Daniel
Universal Energy Systems, Inc.
4401 Dayton Xenia Rd
Dayton, Ohio 45432-1894

ZARZYCKI, J.
Lab. of Science of Materials
Univ. of Montpellier
Montpellier, FRANCE

ZUKOSKI, C.F.
Dept of Chemical Engr.
University of Illinois

PROGRAM

Third International Conference On Ultrastructure Processing Of Ceramics, Glasses And Composites

SAN DIEGO PRINCESS
San Diego, California
February 23-27, 1987

Sponsored by :
University of California, Los Angeles
Department of Materials Science and Engineering

Supported by:
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Dr. J. D. Mackenzie
Dr. D. R. Ulrich

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MONDAY, FEBRUARY 23, 1987

4:00 - 8:00 PM	Registration
6:00 - 8:00 PM	Welcoming Party

TUESDAY, FEBRUARY 24. 1987

7:00 - Noon	Registration
1:00 - 5:00 PM	
8:30	Welcome : J. D. Mackenzie and D. R. Ulrich

SESSION I : KEYNOTE ADDRESS

8:40 - 9:30 — **Professor W. D. Kingery**
History of Ceramic Processing

SESSION II : PRECURSORS AND CHEMISTRY FOR ULTRASTRUCTURE PROCESSING
Co-Chairs : D. Ball, H. R. Allcock

9:40	1	Organometallic Polymer Precursors to Ceramics: New Systems	Seyferth, D.	MIT
10:10	2	Silicon and Aluminum-Containing Carboranes as Potential Ceramic Precursors	Hawthorne, M. F., Rees, Jr.,W. S., Schubert, D. M. and Knobler, C. B.	UCLA
10:40		COFFEE		
11:00	3	Sol-Gel Glasses: Investigations of Fundamental Chemistry Features and Siloxane Modification	McGrath, J. E., Pullockaren, J., Riffle, J. S. and Smith, S. D.	VPI
11:30	4	Chemical Modifications of Titanium Alkoxide Precursors	Sanchez, C., Babonneau, F., Doeuff, S., Henry, M. and Leaustic, A.	Paris VI, France
11:50	5	Processible Boron Nitride Preceramic Polymers	Paciorek, K. L.	Ultrasystems
12:10		LUNCH		
1:15	6	Preparation of Aluminum Nitride and AlN/SiC Solid Solutions Using Organometallic Precursors	Interrante, L. V., Hackney, M., Whitmarsh, C. and Zhiping, J.	RPI
1:35	7	Some New Possibilities for the Preparation of Silica Gels	Corriu, R., Pauthe, M., Phalippou, J.,Leclercq, D. and Vioux, A.	Montpellier, France
1:55	8	Polymer Precursors & Model Systems for Graphite Materials	Dalton, L., Nalwa, H.,Thomson, J., Young, C. and Bryson, P.	USC

SESSION III : SOL-GEL SCIENCE AND TECHNOLOGY

Co-Chairs : A. Guenther , J. Zarzycki

2:15	9	Optical Properties of Gel-SiO_2 Glasses	Hench, L.L., Wang, S.K., and Campbell, C.	Univ. of Florida
2:45	10	Various Factors Affecting the Conversion of Silicon Alkoxide Solutions to Gels	Sakka, S., Kozuka, H. and Kim, S.	Institute for Chemical Research, Kyoto Univ., Japan
3:15	11	Time-Dependence of the Viscosity of Sol-Gel Processed Silica	Klein, L. C. and Gallo, T. A.	Rutgers Univ.
3:35		COFFEE		
3:50	12	A Predictive Model for Inorganic Polymerization Reactions	Livage, J. and Henry, M.	Paris VI, France
4:20	13	Growth Process of Al_2O_3-SiO_2 Gels	Pouxviel, J. C. and Boilot, J. P.	Ecole Polytechnique, France
4:40	14	Ultrafilters by the Sol-Gel Process	Cot, L.	ENSC Montpellier, France
5:00	15	Fundamentals of Sol-Gel Film Formation	Brinker, C. J. and Hurd, A. J.	Sandia National Laboratories
5:20	16	Isotopic Effects in Alkoxysilane Sol-Gel Processing	Hardman-Rhyne, K. A., Coyle, T. D., and Lewis, E. P.	National Bureau of Standards

6:00 - 7:00 PM **POSTER SESSION** (Posters are listed at the back of the program)

8:00-10:00 DINNER, Guest Speaker: **Dr. J. O. Dimmock**, Technical Director of A. F. O. S. R., "The Role of Air Force Basic Research"

WEDNESDAY, FEBRUARY 25,1987

SESSION III : SOL-GEL SCIENCE AND TECHNOLOGY (Continued)
Co-Chairs : M. Ohmer , L. L. Hench

8:00	17	Coatings: The Land of Opportunity for Sol-Gel Technology	Uhlmann, D. R.	Univ. of Arizona
8:30	18	Sonogels: An Alternative Method in Sol-Gel Processing	Zarzycki, J. and Esquivias, L.	Univ. of Montpellier, France
9:00	19	Magnetic Properties of Some Sol-Gel Ferrites	MacCrone, R. K. and Lieb, S.	RPI
9:20	20	Rheology of Particulate Silica Gels	Rabinovich, E. M. and Kopylov, N. J.	Bell Labs
9:40	21	Drying Mechanics of Gels	Scherer, G. W.	DuPont
10:00		COFFEE		
10:15	22	NMR and Raman Studies of Mixed Alkoxide Systems	Jonas, J., Irwin, A. D., Holmgren, J. S. and Zerda, T. W.	Univ. of Illinois
10:35	23	Amine-Silicate: An Alternative Gel Method for the Synthesis of Amorphous Silicates	Guglielmi, M. and Maliavski, N.	U of Padova, Italy
10:55	24	Effect of Acetic Acid on the Chemistry of Silica Sol-Gels	Campero, A., Arroyo, R. and Sanchez, C.	Mexico Paris VI, France
11:15	25	Effect of Polycondensation Reactions on the Microstructure in Alumina System	Yoldas, B.E.	PPG
11:35	26	Formation of Complex Fused Silica Shapes by a Silicate Gelation Process	Shoup, R. D.	Corning Glass
11:55	27	Effects of Temperature and Time on the Structural Evolution of Alkoxy-Derived Silica Gel	Yasumori, A.,Yamane, M. and Kawaguchi, T.	Tokyo Inst. of Tech Asahi Glass
12:15	28	A Theoretical Study of the Silanol Polymerization Mechanism	Davis, L. P. and Burggraf, L. W.	AFOSR
12:35	29	Influence of Formation Parameters on the Mechanical Properties of Gels	Modugno, S. A., Fleming, J. W. and Klein, L. C.	Bell Labs Rutgers Univ.

LUNCH *(Break for the Rest of the Day)*

THURSDAY, FEBRUARY 26, 1987

SESSION IV : POWDERS AND COLLOIDS

Co-Chairs : K. S. Mazdiyasni , S. Sakka

8:00	30	Colloidal Processing of Ceramic Composites with Ultrafine Particles	Aksay, I. A.	Univ. of Washington
8:30	31	Preparation of Oxide Powders	Bowen, H. K., Riman, R., McMahon, T., Bagley, A., Gowda, G.,Hoppener, R. and Rhine, W.	MIT
9:00	32	Preparation and Interactions of Colloids of Interest in Ceramics	Matijevic, E.	Clarkson Univ.
9:30	33	Synthesis of Alumina-Zirconia Powders by Sol-Gel Processing	Bond, W. D. and Becher, P. F.	Oak Ridge Nat. Lab.
9:50	34	Theoretical Aspects of Interaction Between Colloidal Particles with Various Shapes in Liquid	Tateyama, H., Hirosue, H., Nishimura, S.,Tsunematsu, K., Jinnai, K. and Imagawa, K.	Gov. Ind. Res. Inst. Kyushu Saga, Japan
10:10		COFFEE		
10:25	35	Stabilized Aluminum Acetate Used for an Alumina Source in Ceramic Fibers	Everitt, G. F.	3M
10:45	36	Monodisperse Silica Powders: How to Control Their Size	Zukoski, C. F., Bogush, G. H. and Tracy, R. M.	Univ. of Illinois
11:05	37	Precipitation and Properties of PZT and PLZT Powders	Schwartz, R. W., Payne, D.A., Eccles, P. M. and Eichorst, D. J.	Univ. of Illinois

SESSION V : ADVANCED CERAMICS

Co - Chairs : L. Smith , H. Schmidt

11:25	38	Formation of SiC Fibers and Related Ceramic Fibers from Polycarbosilane	Okamura, K., Sato, M. and Hasegawa, Y.	RIISOM, Tohoku U Oarai Res. Inst. Spec. Inorg. Mat. Asahi, Japan
11:55	39	The Chemical Synthesis of Nanoscale Carbides and Cermets	McCandlish, L. E. and Polizzotti, R. S.	Exxon
12:20		LUNCH		
1:15	40	Controlling Microstructures through Phase Partitioning from Metastable Precursors	Lange, F. F., Marshall, D. B. and Porter, J.	UCSB Rockwell Sc. Center
1:45	41	Disclination Structures in Carbon and Graphite	White, J. L.	Aerospace Corp.
2:15	42	Nanostructure and Mechanical Properties of SiC Using Organosilicon Precursors	Niihara, K., Yamamoto, T., Suganuma, K., Takemoto, T. Nishikawa, T. and Okumura, M.	National Defense Academy, Yokosuka Shin Nisso Kako, Tokyo, Japan
2:35	43	Sol Gel Processing of Acicular Particles of Barium Ferrites	Bernier, J. C. , Najmi, M. and Poix, P.	EHICS Strasbourg, France
2:55		COFFEE		

SESSION VI : COMPOSITES, NOVEL MATERIALS AND TECHNIQUES

Co - Chairs : I. Goldfarb , E. Matijevic

3:10	44	Some New Advances with SSG Derived Nanocomposites	Roy, R.	Penn State U
3:40	45	Amorphous Oxides from Gels	Mackenzie, J. D.	UCLA
4:10	46	Photochemical Probes of the Structures of Porous Solids	Turro, N. J.	Columbia U
4:40	47	Aerogels - A Fascinating Class of Porous Solids	Caps, R. and Fricke, J.	U of Wurzburg, Germany
5:00	48	In-Situ Generation of Ceramic Particles for the Reinforcement of Elastomeric Materials	Mark, J. E.	U of Cincinnati
8:00-10:00		DINNER		

FRIDAY, FEBRUARY 27, 1987

SESSION VI : COMPOSITES, NOVEL MATERIALS AND TECHNIQUES (Continued)
Co - Chairs : A. Matuszko , A. Buckley

8:00	49	Sol/Gel Processing of Fiber-Reinforced Glass Matrix Composites	Pantano, C. G. and Qi, D.	Penn State Univ.
8:20	50	Development of Organic-Inorganic Hard Coatings by the Sol-Gel Process	Schmidt, H., Seiferling,B. and Philipp, G.	FIS, Wurzburg, Germany
8:40	51	Non-Linear Optical Composite Materials Using CdS	Simmons, J. H., Clausen, Jr.,E.M. and Potter, B. G.	U of Florida
9:00	52	Rheological Flow in Superplastic Fine-Grained Ceramic Composites	Wakai, F., Sakaguchi, S., Murayama, N. and Kato, H.	Gov. Ind. Res. Inst. Nagoya Suzuki Motor Co. Japan
9:20	53	Microstructural Definition of Ion-Exchanged Glass Optical Waveguides by Ion-Exchange Process	Ramaswamy, R. V., Chludzinski, P.and Anderson, T. J.	Univ. of Florida
9:40	54	A Versatile Anion Exchanger Derived from the Acid Hydrolysis of Titanium Alkoxides	Giannelis, E. P. and Berglund, K. A.	Michigan State U.
10:00		COFFEE		
10:15	55	Linear Heteroatom Polymers and Their Relationship To Elastomers, Gels, and Ceramics	Allcock, H. R.	Penn State Univ.
10:45	56	Poly[Benzobisthiazole] (PBT)/ Sol-Gel Glass Microcomposites	Kovar, R. F. and Lusignea, R. W.	Foster-Miller
11:05	57	Strength Limiting Features of Polymer Derived Ceramic Fibers	Jaffe, M. and Sawyer, L. C.	Celanese Research
11:25	58	Growth of Alumina Fibers From Intercalated Graphite Precursor Fibers	McQuillan, B. W. and Reynolds, G.	GA Technologies
11:45	59	Role of Supercritical Drying in Structural and Microstructural Evolution of Gel-Glasses: A Critical Review	Mukherjee, S. P.	IBM
12:05	60	Catalytic Synthesis of Silicon Nitride Preceramic Polymers	Laine, R. M., Blum, Y. D., Tse, D., Glaser, R., Chow, A. and Hamlin, R.	SRI
12:25		Lunch and Closing Comments J. D. Mackenzie and D. R. Ulrich		

POSTER SESSION

1	The Synthesis of Silicon Oxynitride and Si-Al-N-O Ceramics from Organosilicon Polymers	Yu, Y. F. and Mah, T. I.	Universal Energy Systems
2	Theoretical Studies of Pentacoordinated Silicon	Gordon, M.S.	North Dakota State
3	Chemistry of Multicomponent Alkoxide Precursors to Ultrastucture Processes	Basil,J.D. and Lin,C.C.	PPG Industries
4	Fluoropolymer Modified Silicate Glasses	Doyle, W. F.and Uhlmann, D.R.	MIT Univ. of Arizona
5	Kinetics of Titanium Alkoxide Hydrolysis	Berglund, K. A., Pryzbocki, C. and Giannelis, E. P.	Michigan SU
6	The Use of GC/MS in the Study of the Hydrolysis and Condensation of Tetraalkoxysilanes	Wheeler, G.	Metro. Mus. of Art
7	Characterization of Alkoxide-Derived Alumina Sols by Gel Filtration Chromatography and Small Angle X-Ray Scattering	Olson, W. L. and Grill, C.M.	Allied-Signal Engineered Mat.
8	Application of ^{183}W NMR to Study Polycondensation of Tungstic Acid Solutions	Chemseddine, A.,Babonneau, F. and Livage, J.	UCLA Paris VI, France
9	The Formation of Non-Bridging Oxygens in Silicate Gels studied by XPS	Heo, J., Yuen, T. J., Nasu, H. and Mackenzie, J. D.	UCLA
10	An ^{27}Al-NMR DTA Study of the Thermal Evolution of Basic Aluminum Salt Derived Alumina	Wood, T. E.	3M
11	Raman and FT-IR Spectroscopy of Rapid Sol-Gel Processes	Che, T. M., Rafalko, J. J. and Dorain, P. B.	Celanese Res. Amherst College
12	Predicting the Evolution of Gel Microstructures from Viscosity-Time Relations	Pope, E. J. A. and Mackenzie, J. D.	UCLA
13	A Rheological Investigation of the Sol-Gel Transition of Orthosilicate Reacting Systems	Melpolder, S. M., Colby, R. H., Coltrain, B. K. and Kelts, L.W.	Eastman Kodak
14	The Preparation of Silica-Gels Containing a Functional Group at Silicon: A Way for the Chemical Transformation of Gels	Pauthe, M. Phalippou, J., Corriu, R., Leclerq, D. and Vioux,A.	Montpellier, France
15	Elaboration and Characterization of Zirconia Gels	Gharbi,N., Amara,C., Zarrouk, H., Sanchez,C.and Livage,J.	Paris VI, France
16	Direct Observation of the Structure of Sols and Gels	Mecartney, M. L., Bellare, J. and Bailey, J. K.	Univ. of Minnesota
17	The Effect of Processing on Gel-Glass Texture: A Review	Orcel, G.	Gel-Tech
18	A Microcrystalline Growth Study of Solvent Effects in Alkoxides by Dynamic Laser Light Scattering	Byers,C. H. and Harris,M.T.	Oak Ridge Nat. Lab.
19	Sintering Behavior of Sol-Gel Derived Anorthite and Cordierite Glass Powders	Zelinski,B.J.J. and Uhlmann,D.R.	MIT Univ. of Arizona
20	Aging Evolution of an Aluminum Hydroxide Gel Made from Aluminum Nitrate	Uhlmann,D.R. and Pierre,A.C	Univ. of Arizona Aerospatiale, France
21	Dielectric Relaxation Analysis Of Gel Drying	Wallace,S. and Hench,L. L.	Univ. of Florida

22	Electrochemical Synthesis of Ceramic Films and Powders	Switzer, J. A.	Univ. of Pittsburgh
23	Competition between Densification and Nitridization in the Ammonolysis of Sol-Gel Derived Silica Films	Fabes, B. D., Dale, G. W. and Uhlmann, D. R.	MIT Univ. of Arizona
24	Fabrication and Mechanical Properties of Si_3N_4/SiC Composites from Fine, Amorphous Si/N/C Powders	Izaki, K., Hakkei, K., Ando, K. Kawakami, T. and Niihara, K.	Mitsubishi Gas Nat. Def. Acad.
25	Synthesis of Fine Silicon Nitride and Silicon Carbide Powders by Carbothermic Reduction	Natansohn, S.	GTE Lab.
26	Zinc Sulfide Ceramic from Organometallics	Harris, D.C., Johnson, C.E.,Roy, D.W. Hickey, D. K. and Willingham, C.B.	Naval Weapons Center,China Lake
27	Low Temperature Route to Ti, Zr, and Hf Diborides	Rhine, W. E.	MIT
28	Dispersion and Crystallization of Laser Derived Si_3N_4 Powders	Danforth, S. C., Symons, W. and Nilsen, K.	Rutgers Univ.
29	Synthesis of Sialon-SiC Composite from Vycor Type Porous Glass	Kim, B. H. and Kim, W. S.	Korea Univ.
30	Processing and Pyrolysis of Si_3N_4/ Polysilazane Bodies	Schwartz, K. B. and Rowcliffe, D. J.	SRI
31	Effect of Drying and Annealing on Metallo-Organic Solution Deposition of PZT Films	Lipeles,R. A. and Coleman,D. J.	Aerospace
32	Organometallic Processing for the Elaboration of $MgTiO_3$ and $BaTiO_3$ Ceramics	El Hadigui, S., Vilminot, S., Bernier, J. C., Poix, P. and Rehspringer, J. L.	EHICS Strasbourg, France
33	Characterization of Copper-Doped Materials Prepared By The Sol-Gel	Sanchez, C., Campero, A. and Arroyo, R.	Paris VI, France Mexico
34	Preparation of Barium and Strontium Titanate by Co-precipitation	Rehspringer, J. L., Nadouf, M., Poix, P. and Bernier, J. C.	Montpellier, France
35	Preparation of $PbTiO_3$ Powder by Sol-Gel and Co-Precipitation Method for Flexible Piezoelectric Composite	Safari,A.	Rutgers Univ.
36	Early Transition Metal Silicon Compounds	Tilley, T. D., Roddick, D. , Arnold,J . Campion, B. and Zhang, C.	UC San Diego
37	Ultra-High Vacuum Deposition of Titanium- Based Multilayers; Application of Pulsed Molecular Beam Sources to Compose Designed Ceramic Films	Nozoye, H., Nishimiya, N., Kawaguchi, K. and Shin, S.	Nat. Chem. Lab. Ind., Tsukuba, Japan
38	PTFE-Silicate Composite Materials Via Sol-Gel Processes	Fabes, B. D. Doyle,W.F., Root, J. and Uhlmann,D.R.	MIT Univ. of Arizona
39	Surface Modification of Carbon Matrix Materials with Transition Metal Silicon Compounds	Tilley,T. D. and Streckert,H.	UC San Diego GA Technologies
40	Silsesquioxane-derived Fibers and Composites	Hurwitz, F.	NASA
41	Sol-Gel Methods for SiO_2 Optical Fiber Coatings	Covino,J. and Wilson, K.	Naval Weapons Center Rutgers Univ.
42	Sol-Gel Coatings	Clark, D. E.	Univ. of Florida

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