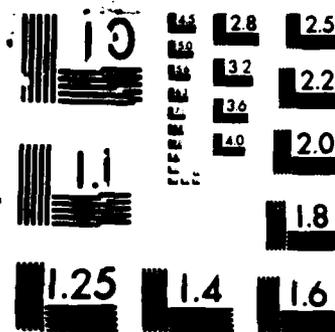


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DEPT OF POLYMER SCIENCE AND ENGINE F E KARASZ
UNCLASSIFIED 14 FEB 86 AFOSR-TR-87-0668 AFOSR-85-0314 F/G 7/6 NL





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FINAL REPORT

INTERNATIONAL CONFERENCE ON ULTRASTRUCTURE IN ORGANIC
AND INORGANIC POLYMERS

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Grant AFOSR 85-0314

15 September 1985 - 14 February 1986

Frank E. Karasz
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AND INORGANIC POLYMERS

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CONTENTS

- I. Title
- II. Principal Investigator
- III. Grant Number
- IV. Dates
- V. Senior Research Personnel
- VI. Junior Research Personnel
- VII. Abstract of Accomplishments
- VIII. Description of Accomplishments
- IX. Publications
- X. Appendix

I. TITLE: International Conference on Ultrastructure in Organic and Inorganic
Polymers

II. PRINCIPAL INVESTIGATOR: Dr. Frank E. Karasz
Polymer Science and Engineering Dept.
University of Massachusetts
Amherst, MA 01003

III. CONTRACT NUMBER: AFOSR 85-0314

IV. DATES: 15 September 1985 - 14 February 1986

V. SENIOR RESEARCH PERSONNEL: None

VI. JUNIOR RESEARCH PERSONNEL: None

VII. ABSTRACT OF ACCOMPLISHMENTS

An International Conference on Ultrastructure in Organic and Inorganic Polymers was held at the University of Massachusetts October 20-24, 1985. The Co-Chairmen were Dr. Donald L. Ulrich, AFOSR and Dr. Frank E. Karasz, UMass. The main focus was on the microstructure of polymeric structures that can be achieved by processing, and its conference included substantial components dealing with the ultrastructures arising from novel manufacturing techniques. The conference performed the useful objective of integrating discrete groups in the materials field and in this respect was the logical successor to two Conferences, with a mainly inorganic ceramic theme, organized in 1983 and 1985 by the University of Florida.

VIII. DESCRIPTION OF ACCOMPLISHMENTS

An International Conference on Ultrastructure in Organic and Inorganic Polymers was held at the University of Massachusetts October 20-24, 1985. The Co-Chairmen were Dr. Donald L. Ulrich, AFOSR and Dr. Frank E. Karasz, UMass.

The conference brought together leading experts in the field of the structure and morphology of organic polymers with a representative group of structural processing leaders in the ceramic field who explored common themes and problems and strengthened communications between the two materials groups.

The program consisted of six half day sessions with an average of four invited papers per session. Ample time was allocated for discussion, poster sessions and for summations.

Each session was devoted to one or more of the following themes:

- a. Structure in Block Copolymers
- b. Polymer Morphology Developed by Processing
- c. Polymers from Precursors
- d. Ionic Domains in Polymers
- e. Ultrastructure in Ceramics (mostly review papers)
- f. Composite Structures

Twenty-three invited papers were presented. The poster session contained thirteen contributions.

The Conference took place in the fully equipped Conference Center and Hotel which was available on campus (rooms and facilities had already been reserved for this period) and the Conference Service infrastructure was available to assist in the organizational details. Approximately 180 scientists (not including UMass students and faculty) attended the Conference.

The budget reflected the international nature of the meeting. The Conference covered the costs of invited academic and government speakers for travel and living (no honoraria were offered). Industrial scientists (invited and contributing) were self-supported.

The Program for the invited papers is appended.

IX. PUBLICATIONS

None

Final Program

All Technical Sessions will be in the Campus Center Auditorium. The Poster Session will be in Room 163, Campus Center.

Sunday, October 20

3:00-7:00 p.m. Registration, Hotel Lobby, 3rd Level, Campus Center

7:00 p.m. Informal mixer, Room 1009 (10th floor), Campus Center

Monday, October 21

AM Chairman: Donald Ulrich, AFOSR

7:30-8:45 Registration, Arcon Desk, 1st Floor Campus Center

9:00 Welcoming Remarks: Chancellor Joseph Duffey

9:20-10:10 H. Allcock, Pennsylvania State University
POLYPHOSPHAZENES AS PRECURSORS TO CERAMICS

10:10-11:00 Robert C. West, University of Wisconsin
POLYSILANES: A NEW CLASS OF HIGH POLYMERS AND THEIR TECHNOLOGICAL APPLICATIONS

11:00-11:20 Coffee Break

11:20-12:10 Dietmar Seyferth, MIT
THE INORGANIC AND ORGANOMETALLIC POLYMER ROUTE TO CERAMIC MATERIALS

PM Chairman: Ivan Goldfarb, AFML

1:45-2:35 John D. Mackenzie, University of California, Los Angeles
POLYMER-IMPREGNATED POROUS GLASS COMPOSITES

2:35-3:25 Rustum Roy, Pennsylvania State University
USE OF NATURAL MODELS AND TEMPLATES IN SYNTHESIS OF CERAMIC MICRO AND NANO COMPOSITES

3:25-4:15 H. Kent Bowen, MIT
CHEMICAL APPROACHES TO CERAMIC PARTICULATES

4:30-6:00 Poster Session, Room 163
Soft drinks and Cheese

Tuesday, October 22

AM Chairman: E. L. Thomas, UMASS

8:30-9:20 Larry L. Hench, University of Florida
ULTRASTRUCTURE OF SOL-GEL GLASSES

9:20-10:10 Donald R. Uhlmann, MIT
THE FORMATION OF CERAMICS BY POLYMERIZATION PROCESSING

10:10-10:30 Coffee Break
Chairman: Donald Ball, AFOSR

10:30-11:20 A.F. Garito, University of Pennsylvania
MOLECULAR NONLINEAR OPTICS: NONLINEAR OPTICAL PROPERTIES IN ORGANIC AND POLYMER SYSTEMS

11:20-12:10 Anselm C. Griffin, University of Southern Mississippi
NITROAROMATIC LIQUID CRYSTALLINE POLYMERS: UNIQUE STRUCTURES FOR NONLINEAR OPTICAL MATERIALS

PM Free

Wednesday, October 23

AM Chairman: Phillip Parrish, DARPA

8:30-9:20 Larry R. Dalton, University of Southern California
ULTRASTRUCTURE IN CONDUCTING POLYMERS: THE ROLE OF DELOCALIZED π -ELECTRONS

9:20-10:10 Gary E. Wnek, MIT
ELECTRICALLY CONDUCTING COPOLYMERS AND BLENDS

10:10-10:30 Coffee Break
Chairman: A. Matuszko, AFOSR

10:30-11:20 Michael Jaffe, Celanese
PROCESS-STRUCTURE-PROPERTY RELATIONSHIPS OF HIGHLY ORIENTED POLYMERS

11:20-12:10 H.H. Winter, University of Massachusetts
FLOW INDUCED STRUCTURE AND RHEOLOGY OF BLOCK COPOLYMERS

PM Chairman: Frank N. Kelley, University of Akron

1:45-2:35 Hugh Brown, IBM, San Jose
SMALL-ANGLE X-RAY SCATTERING STUDIES ON THE EFFECT OF DEFORMATION ON CRAZE MORPHOLOGY

2:35-3:25 James E. McGrath, Virginia Polytechnic Institute and State University
ORGANOSILOXANE BLOCK AND SEGMENTED POLYMERS: SYNTHESIS, BULK, SURFACE AND DEGRADATION BEHAVIOR

3:25-4:15 Paras N. Prasad, SUNY, Buffalo
MOLECULAR MECHANICS OF POLYMERIC THIN FILMS

4:15-5:00 G. Hadziioannou, IBM
PROPERTIES OF BLOCK COPOLYMERS A) IN THE MESOMORPHIC STATE B) ADSORBED ON A SURFACE

6:30 Social Hour

7:30 Banquet

Social hour and banquet at the Northampton Hilton Inn (I-91/US 5). Transportation provided at 6:00 pm.

Thursday, October 24

AM Chairman: Frank E. Karasz, University of Massachusetts

8:30-9:20 Ezio Martuscelli, CNR, Arco Felice, Naples
COPOLYMER FORMATION DURING PROCESSING OF RUBBER-CONTAINING BLENDS: INFLUENCE OF COPOLYMER STRUCTURE ON MORPHOLOGY AND BLEND PROPERTIES

9:20-10:10 Ronald K. Eby, The Johns Hopkins University
CRYSTAL DEFECTS AND THE HIGH PRESSURE PHASE OF PTFE

10:10-10:30 Coffee Break

10:30-11:20 Wade Adams and T. Helminiak, AFML
ULTRASTRUCTURE OF ORDERED POLYMERS

11:20-12:10 Dale L. Handlin, Shell
COMPOSITION-MORPHOLOGY-PROPERTY RELATIONSHIPS OF TRIBLOCK AND STAR DIBLOCK COPOLYMERS

12:10-1:00 J.E. Mark, University of Cincinnati
BIMODAL NETWORKS AND NETWORKS REINFORCED BY THE IN-SITU PRECIPITATION OF FILLERS

Conference Adjourned
Lunch Available

END

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