



Strasbourg (France)

E-MRS Spring Meeting 2004
May 24-28, 2004

SYMPOSIUM Q

Polymer derived ceramics (PDCs)

Symposium Organizers:

Florence Babonneau, LCMC, University of Paris, France

Philippe Miele, LMI, University of Lyon, France

Ralf Riedel, Technical University of Darmstadt, Germany

Gian Domenico Soraru, DIMTI, University of Trento, Italy

Papers will be published in Journal of the European Ceramics Society

E-MRS 2004 SPRING MEETING

SYMPOSIUM Q

Tuesday, May 25, 2004

Morning

Session I : Synthesis

Chairpersons : P. Miele & F. Babonneau

	09:00		INTRODUCTION
Q-I.1	09:10	-Invited-	THE DESIGN, SYNTHESSES, AND APPLICATIONS OF CHEMICAL PRECURSORS TO NONOXIDE CERAMIC MATERIALS Larry G. Sneddon , Mark J. Pender, Kersten M. Forsthoefel, Xiaolan Wei and Upal Kusari, Department of Chemistry, University of Pennsylvania, USA
Q-I.2	09:50	-Invited-	SYNTHESIS AND PROPERTIES OF PRECERAMIC Si-B-C-N POLYMERS WITH TUNABLE CHEMICAL COMPOSITION M. Weinmann , M. Hörz, A. Müller, S. Bernard and F. Aldinger, Max-Planck-Institut für Metallforschung, Heisenbergstr. 3, 70569 Stuttgart, Germany
	10:30		BREAK
Q-I.3	11:00	-Invited-	DESIGN OF PROCESSIBLE BORAZINE-BASED PRECURSORS FOR THE PREPARATION OF BN FIBERS D. Cornu , S. Bernard, S. Duperrier, B. Toury and P. Miele, Laboratoire des Multimatériaux et Interfaces, UMR 5615 CNRS – Université Claude Bernard Lyon 1, 43 Bd du 11 Novembre 1918, 69622 Villeurbanne Cedex, France
Q-I.4	11:40		NEW TYPE OF PRECURSOR FOR FIBERS AND MATRICES IN THE SYSTEM SI-C J. Clade , E. Seider, D. Sporn, Fraunhofer-Institut für Silicatforschung ISC, Neunerplatz 2, 97082 Würzburg, Germany
	12:00		LUNCH

Tuesday, May 25, 2004

Afternoon

Session II : Characterisation

Chairpersons : L. Sneddon & L. Interrante

- Q-II.1** 14:00 -Invited- HIGH RESOLUTION SOLID STATE NMR INVESTIGATION OF VARIOUS PRECERAMIC POLYMERS AND THEIR PYROLYSIS DERIVATIVES
Christel Gervais, Florence Babonneau, Chimie de la Matière Condensée, Université Pierre et Marie Curie, 4 place Jussieu, 75252 Paris Cedex 05, France
- Q-II.2** 14:40 COMPLETE CHARACTERIZATION OF BN FIBRES OBTAINED FROM A NEW POLYBORYLBORAZINE
B. Toury, D. Cornu, F. Chassagneux and P. Miele, Laboratoire des Multimatériaux et Interfaces, UMR CNRS 5615, Université Claude Bernard Lyon 1, 69622 Villeurbanne Cedex, France
- Q-II.3** 15:00 CARBON-RICH SILICON OXYCARBIDE - SYNTHESIS AND NANOSTRUCTURE CHARACTERIZATION
Y.B. Blum and D.B MacQueen, SRI International, Menlo Park CA, USA, H-J. Kleebe, Colorado School of Mines CO, USA
- Q-II.4** 15:20 -Invited- THE FATE OF CARBON IN POLYMER-DERIVED SiCO CERAMICS
Hans-Joachim Kleebe(a) and Yigal Blum(b), (a)Colorado School of Mines, Metallurgical and Materials Engineering Dept., Golden CO 80401, USA, (b)SRI international, Menlo Park CA 94025, USA
- 16:00 **BREAK**
- Q-II.5** 16:20 THE MICRO-STRUCTURE OF POLYMER DERIVED AMORPHOUS SILICON CARBIDE LAYERS
A. Hilbig(a), E .Müller(a), R. Wenzel(b), G. Roewer(b), E. Brendler(c), G. Irmer(d), G. Schreiber(e), Freiberg University of Mining and Technology, Germany: (a)Institute of Ceramic Materials, (b)Institute of Inorganic Chemistry (c)Institute of Analytical Chemistry, (d)Institute of Theoretical Physics, (e)Institute of Physical Metallurgy
- Q-II.6** 16:40 CORRELATION BETWEEN STRUCTURAL FEATURES AND MECHANICAL PROPERTIES OF BORON NITRIDE FIBRES DERIVED FROM ALKYLAMINOBORAZINES
P. Miele(a), B. Toury(a), F. Chassagneux(a), R. Fulchiron(b). (a)Laboratoire des Multimatériaux et Interfaces, UMR CNRS 5615 – Université Claude Bernard Lyon 1, 69622 Villeurbanne Cedex, France. (b)Laboratoire des Matériaux Polymères et des Biomatériaux UMR CNRS 5627 – Université Claude Bernard Lyon 1, 69622 Villeurbanne Cedex, France
- Q-II.7** 17:00 -Invited- MODELING OF POLYMER-DERIVED AMORPHOUS CERAMICS
Peter Kroll, Inorganic Chemistry, RWTH Aachen, Germany

Wednesday, May 26, 2004

Afternoon

Session III : Processing and Properties

Chairpersons : R. Riedel & G.D. Sorarù

- Q-III.1** 14:00 -Invited- CERAMIC PROCESSING WITH FILLER-LOADED PRECERAMIC POLYMERS
Michael Scheffler, Department of Materials Science & Engineering, University of Washington, Seattle WA, USA
- Q-III.2** 14:40 SPRAY WINDING, A NOVEL ONE-STEP SPRAY-TECHNOLOGY TO PERFORM CMC'S FROM PRECERAMIC POLYMERS
O. Goerke, E. Feike, H. Schubert, Institute for material science and -technology, Technical University Berlin, Germany
- Q-III.3** 15:00 NOVEL APPLICATION OF PRECERAMIC PRECURSORS FOR THE FABRICATION OF COMPOSITES
Andreas Herzog, Maik Thuenemann, Ulrich Vogt, Olivier Beffort, EMPA, Duebendorf, Switzerland
- Q-III.4** 15:20 FABRICATION OF POLYMER DERIVED CERAMIC PARTS BY SELECTIVE LASER CURING
T. Friedel(a), N. Travitzky(a), F. Niebling(b), A. Otto(b) and P. Greil(a), (a)University of Erlangen-Nuernberg, Dept. of Materials Science, Erlangen, Germany, (b)University of Erlangen-Nuernberg, Dept. of Manufacturing Technology, Erlangen, Germany
- Q-III.5** 15:40 MICROSTRUCTURING PRECERAMIC POLYMERS BY APPLICATION OF UV- AND DEEP X-RAY LITHOGRAPHY
Michael Schulz(a,d), Martin Börner(b), Jost Göttert(c), Thomas Hanemann(a,d), Richard Heldele(d), Günter Motz(e), Jürgen Haußelt(a,d), (a)Forschungszentrum Karlsruhe, Institut für Materialforschung III, (b)Forschungszentrum Karlsruhe, Institut für Mikrostrukturtechnik, (c)CAMD, Baton Rouge, Louisiana, USA, (d)Universität Freiburg, Institut für Mikrosystemtechnik, (e) Universität Bayreuth, Lehrstuhl Keramik und Verbundwerkstoffe (IMA), Germany
- Q-III.6** 16:00 MANUFACTURE AND PROPERTIES OF LONG FIBRE REINFORCED CERAMICS CONTAINING AL AND TI FILLERS BASED ON THE PIP PROCESS
G. Stantshev, M. Friß, W. Krenkel, R. Kochendörfer, German Aerospace Center, DLR, Stuttgart, Germany
- 16:20 **BREAK**
- Q-III.7** 16:40 IMPROVED DURABILITY OF SI/B/N/C RANDOM INORGANIC NETWORKS
Th. Jäschke, M. Jansen, Max-Planck-Institut für Festkörperforschung, Heisenbergstraße 1, 70569 Stuttgart, Germany
- Q-III.8** 17:00 MECHANICAL PROPERTIES OF CERAMIC MATRIX COMPOSITES WITH SILOXANE MATRIX AND LIQUID PHASE COATED CARBON FIBER REINFORCEMENT
R. Gadow, F. Kern, H. Ulutas, Institute for Manufacturing Technologies of Ceramic Components and Composites, University of Stuttgart, Allmandring 7b, 70569 Stuttgart Germany
- Q-III.9** 17:20 FORMATION KINETICS OF NANO-CRYSTALLINE SIC IN AMORPHOUS SI-(B-)C-N
H. Schmidt, W. Gruber, G. Borchardt, FB Physik, Metallurgie und Werkstoffwissenschaften, TU Clausthal, Robert-Koch-Str. 42, 38678 Clausthal-Zellerfeld, Germany and A. Müller, J. Bill, Institut für Nichtmetallische Anorganische Materialien, PML, U Stuttgart, Heisenbergstr. 3, 70569 Stuttgart, Germany

Thursday, May 27, 2004

Morning

Session IV : Products I

Chairpersons : Y. Blum & H.J. Kleebe

- Q-IV.1** 09:00 -Invited- METHYLENE-BRIDGED CARBOSILANES AND POLYCARBOSILANES AS PRECURSORS TO SILICON CARBIDE - FROM SiC NANOTUBES TO BULK CERAMIC OBJECTS
Leonard V. Interrante(a), Michael Lienhard(b), Qing-Min Cheng, Kevin Moraes, Walter Sherwood(c) and Steve Atmur(c), (a)Chemistry Department, Rensselaer Polytechnic Institute, Troy, NY 12180-3590, (b)NASA Glenn Research Center, MS 77-1, Cleveland, OH 44135, and (c)Starfire Systems Inc., Saratoga Technology & Energy Park, 10 Hermes Road, Malta, NY 12020, USA
- Q-IV.2** 09:40 MICRO-CELLULAR POROUS CERAMICS FROM PRECERAMIC POLYMERS: FABRICATION, PROPERTIES AND APPLICATIONS
Paolo Colombo(a), Lisa Biasetto(b) and Enrico Bernardo(b). (a)Università di Bologna, Dipartimento di Chimica Applicata e Scienza dei Materiali, V.le Risorgimento 2, 40136 Bologna, Italy and Department of Materials Science and Engineering, The Pennsylvania State University, University Park PA 16802, USA. (b)Università di Padova, Dipartimento di Ingegneria Meccanica – Settore Materiali, via Marzolo 9, 35131 Padova, Italy
- Q-IV.3** 10:00 COMPARATIVE FABRICATION OF SiCN CERAMIC PATTERNS FROM CFL AND MIMIC TECHNIQUES
Kyoung-Hoon Park(a), In-Kyung Sung(a), Hong H. Lee(b), Dong-Pyo Kim(a), (a)Dept of Fine Chemical Engineering and Chemistry, Chungnam national University, Daejeon, 305-764 Korea, (b)School of Chemical Engineering, Seoul National University, Seoul, 151-742 Korea
- 10:20 **BREAK**
- Q-IV.4** 10:40 -Invited- NANODEVICES THAT EXPLORE THE SYNERGIES BETWEEN PDCs AND CARBON NANOTUBES
Rishi Raj and Sandeep R. Shah, Department of Mechanical Engineering, University of Colorado at Boulder, Boulder CO 80309-0427, USA
- Q-IV.5** 11:20 PREPARATION OF HIGH-TEMPERATURE STABLE Si-B-C-N FIBERS FROM TAILORED SINGLE SOURCE POLYBOROSILAZANES
S. Bernard(a), M. Weinmann(b), D. Cornu(a), P. Miele(a), F. Aldinger(b). (a)Laboratoire des Multimateriaux et Interfaces, UMR CNRS 5615-Université Claude Bernard Lyon 1, 69622 Villeurbanne Cedex, France. (b)Max-Planck-Institut für Metallforschung, Pulvermetallurgisches Laboratorium, Heisenbergstrasse 5, 70569 Stuttgart, Germany
- Q-IV.6** 11:40 SYNTHESIS AND PROPERTIES OF POLYMER DERIVED METAL / SiCN CERAMIC MICRO- AND NANO-COMPOSITES Adel Francis(a), Ralf Hauser(b), and Ralf Riedel(b), (a)Central Metallurgical Research and Development Institute (CMRDI), P.O.box 87 Helwan –Cairo, Egypt, (b)Darmstadt University of Technology, Institute of Materials Science, Petersenstraße 23, 64287 Darmstadt, Germany
- Q-IV.7** 12:00 **LUNCH**

Thursday, May 27, 2004

Afternoon

Session V : Products II

Chairpersons : R. Raj & M. Weinmann

- Q-V.1** 14:00 -Invited- PRECURSORS DERIVED CERAMIC MEMBRANES
Yuji Iwamoto, Japan Fine Ceramics Center, 2-4-1 Mutsuno, Atsuta-ku, Nagoya 456-8587, Japan
- Q-V.2** 14:40 PERIODIC MESOPOROUS SiO GLASSES FROM SOL-GEL TEMPLATING APPROACH
Bérangère Toury, **Florence Babonneau**, Chimie de la Matière Condensée, UPMC-CNRS, 4 place Jussieu, 75005 Paris, France
- Q-V.3** 15:00 EVALUATION OF STRUCTURE AND POROSITY CHANGES IN CARBON AEROGELS
Young-Jae Lee, R&D Center, Samsung Fine Chemicals, Co., Ltd., 103-1 Moonji-dong, Yoosung-gu, Daejeon 305-380 Korea
- Q-V.4** 15:20 CERAMERS – FUNCTIONAL MATERIALS FOR ADSORPTION TECHNIQUES
Michaela Wilhelm, Christian Soltmann, Dietmar Koch, Georg Grathwohl, Keramische Werkstoffe und Bauteile, University of Bremen, Am Biologischen Garten 2/IW3, 28359 Bremen, Germany
- 15:40 **BREAK**
- Q-V.5** 16:00 SYNTHESIS AND CHARACTERIZATION OF BULK LUMINESCENT Si/SiO₂ NANOCOMPOSITES THROUGH GEL PYROLYSIS
P. Bettotti(a), G. Das(a), S. Modena(b), L. Pavesi(a), G. Mariotto(a), **G.D. Soraru**(b), (a)Dipartimento di Fisica, Università di Trento, Via Sommarive 14, 38050 Trento, Italy, (b)Dipartimento di Ingegneria dei Materiali e Tecnologie Industriali, Università di Trento, Via Mesiano 77, I-38050 Trento, Italy
- Q-V.6** 16:20 SELF ORGANISATION OF NANOCRYSTALS IN AN AMORPHOUS MATRIX THROUGH PHASE SEPARATION MECHANISM IN SOL-GEL DERIVED MATERIALS
A. Gaudon, A. Lecomte, B. Soulestin, R. Guinebretière, A. Dager. Science des Procédés Céramiques et de Traitements de Surface, UMR 6638. ENSCI, 47 Av. A. Thomas 87065 Limoges, France.
- Q-V.7** 16:40 SiBCO CERAMICS FROM POLYBOROSILOXANES
Verena Liebau, Ralf Hauser and Ralf Riedel, University of Technology Darmstadt, Institute of Materials Science, Petersenstr. 23, 64287 Darmstadt, Germany
- Q-V.8** 17:00 LOW TEMPERATURE SYNTHETIC ROUTE FOR BORON CARBIDE
Shampa Mondal and Ajit K. Banthia, Materials Science Centre, Indian Institute of Technology, Kharagpur-721302, India