Scientific Programme

14th INTERNATIONAL CERAMICS CONGRESS

OPENING SESSION

WELCOME ADDRESSES

Plenary Lectures

C:PL1 **Fueling Human Progress with Sunlight**
H. ATWATER, Joint Center for Artificial Photosynthesis, California Institute of Technology, Pasadena, CA, USA

C:PL2 **Advanced Ceramics for Energy Systems and Environmental Technology**
A. MICHAELIS, Fraunhofer Institute of Ceramic Technologies and Systems, IKTS, Dresden, Germany

SYMPOSIUM CA

PROGRESS IN POWDER PROCESSING SCIENCE AND MANUFACTURING FOR ADVANCED CERAMICS AND COMPOSITES

Session CA-1

Advances in powder synthesis and characterisation

CA-1:IL01 **Magnetic Field Assisted Freeze Casting of Ceramic Powders**
J. McKITTRICK, University of California San Diego, La Jolla, CA, USA; M.M. PORTER, Clemson University, Clemson, SC, USA; M.B. FRANK, nanoComposix, Inc., San Diego, CA, USA

CA-1:IL02 **Synthesis and Characterization of Nanoparticles**
M.-A. EINARSRUD, M. SLETNES, T.O.L. SUNDE, P.M. RORVIK, A. DALOD, T. GRANDE, Department of Materials Science and Engineering, NTNU Norwegian University of Science and Technology, Trondheim, Norway

CA-1:IL03 **Synthesis of Oxide Particles: From Polymeric Precursors to Colloidal Synthesis Process**
E.R. LEITE, Brazilian Nanotechnology National Laboratory - LNNano, Campinas, SP, Brazil

CA-1:IL04 **Spray Pyrolysis of Fine Oxide Powder**
K. WIIK, NTNU, Trondheim, Norway; S. LABONNOTE-WEBER, G. SYVERTSEN-WIIG, CerPoTech AS, Heimdal, Norway

CA-1:L05 **Synthesis of Submicronic Silica Janus Particles by a Pickering Emulsion Method: Towards the Characterization of their Assemblies**
K. LEBDIOUA, A. AIMABLE, M. CERBELAUD, A. VIDECOQ, SPCTS, Limoges, France

CA-1:L06 **Synthesis of Indium Hydroxide Powders by a Precipitation Method**
WOO-SEOK CHO[1], EUN-KYOUNG CHOI[1,2], WON-JUN LEE[1,3], KYU-SUNG HAN[1], UNG-SOO KIM[1], JIN-HO KIM[1], KWANG-TEAK HWANG[1], JONG-YOUNG KIM[1], HAE-JIN HWANG[3], KWANG-BO SHIM[2], [1]Korea Institute of Ceramic Engineering and Technology, Icheon, South Korea; [2]Dept.of Materials Science and Engineering, Hanyang University, Seoul, South Korea; [3]School of Material Science and Engineering, Inha University, Incheon, South Korea

CA-1:L07 **Effect of Iron Oxide Coloring on the Microstructure, Mechanical Properties and Aging Stability of 3Y-TZP**
E. WILLEMS[1,2], F. ZHANG[1,2], B. VAN MEERBEEK[2], J. VLEUGELS[1], [1]Dept. of Metallurgy and Materials Engineering, KU Leuven, Kasteelpark Leuven, Belgium; [2]KU Leuven BIOMAT, Dept. of Oral Health Sciences, KU Leuven & Dentistry, University Hospitals Leuven, Leuven, Belgium

CA-1:L08 **Structural and Transport Properties of Neodymium Tungstates Prepared via Mechanochemical Activation**
Y.N. BESPALKO, V.A. SADYKOV. P.I. SKRYABIN, T.A. KRIEGER, Boreskov Institute of Catalysis, Novosibirsk, Russia; N.F. UVAROV, A.S. ULIHIN, Institute of Solid State Chemistry and Mechanochemistry, Novosibirsk, Russia

CA-1:L09 **High-performance Nanostructured T'-YSZ Feedstocks Synthesized by Nanopowder Granulation**
FEIFEI ZHOU[1,2], YOU WANG[1], MIN LIU[2], YAMING WANG[1], LIANG WANG[3], [1]Dept of Materials Science, School of Materials Science and Engineering, Harbin Institute of Technology, Harbin, China; [2]National Engineering Lab. for Modern Materials Surface Engineering Technology & The Key Lab of Guangdong for Modern Surface Engineering Technology, Guangdong Institute of New Materials, Guangzhou, China; [3]Key Laboratory of Inorganic Coating Materials CAS, Shanghai Institute of Ceramics, CAS, Shanghai, China

Session CA-2

Colloidal Processing

CA-2:IL01 **Powder-Less Processing for Nano-structured Functional Ceramics: Realization of direct Fabrication from Solutions and/or Melts**
MASAHIRO YOSHIMURA, Materials Sci. & Eng. National Cheng Kung University, Tainan, Taiwan & Tokyo Institute of Technology, Tokyo, Japan

CA-2:IL02 **Layer by Layer Modification of Nanoparticles Surfaces in Suspension: From Order to Chaos during the Nanostructured Growth of a Ceramic Film**
B. FERRARI, Z. GONZALEZ, J. YUS, A.J. SANCHEZ-HERENCIA, Institute of Ceramics and Glass, CSIC, Tailoring through Colloidal Processing Group, Madrid, Spain

CA-2:L03 **Role of Electrostatic Interactions in the Adsorption of Colloids in Pickering Emulsions**
M. CERBELAUD, A. VIDECOQ, A. AIMABLE; Univ. Limoges, CNRS, SPCTS, UMR 7315, Limoges, France; L. ALISON, H. TERVOORT, A. STUDART, Complex Materials, Department of Materials, ETH Zurich, Zurich, Switzerland

CA-2:IL04 **Processing of Stable and Reliable Zirconia Ceramics for Dental Applications**
FEI ZHANG[1,2,3], J. VLEUGELS[1], H. REVERON[3], T. FÜDERER[4], S. SCHOMER[4], N. COURTOIS[5], A. LIENS[3], B. VAN MEERBEEK[2], J. CHEVALIER[3], [1]University of Leuven, Dept of Materials Engineering, Heverlee, Belgium; [2]University of Leuven & Dentistry, BIOMAT, Dept of Oral Health Sciences, University Hospitals Leuven, Leuven, Belgium; [3]University of Lyon, UMR CNRS 5510 (MATEIS), INSA de Lyon, France; [4]Ceramic Materials, Swerea IVF AB, Mölndal, Sweden; [5]ANTHOGYR, Sallanches, France

CA-2:IL05 **Colloidal Process of Hematite Photoanode for Solar Water Splitting**
F.L. SOUZA, Universidade Federal do ABC, Santo Andre, Sao Paulo, Brazil

CA-2:IL06 **New Water-based Organic Additives in Colloidal Processing of Ceramics and Composites**
M. SZAFRAN, Warsaw University of Technology, Faculty of Chemistry, Warsaw, Poland

CA-2:L07 **Homogeneity Enhancement of Additives on Boron Carbide by Precipitation Method**
M.F. TOKSOY, C. ELCI, Izmir Institute of Technology, Department of Mechanical Engineering, Turkey

Session CA-3

Shape Forming and green body processing and characterization

CA-3:IL01 **Aqueous Gelcasting: A Versatile and "Green" Technique to Shape Ceramics**
L. MONTANARO, P. PALMERO, M. LOMBARDI, C. PETIT, J.-M. TULLIANI, Dept. Applied Science and Technology DISAT, Politecnico di Torino, Torino, Italy

CA-3:IL02 **Nano/Microstructure Control of Advanced Materials and their Applications by Smart Powder Processing**
MAKIO NAITO, TAKAHIRO KOZAWA, AKIRA KONDO, Joining and Welding Research Institute (JWRI), Osaka University, Ibaraki, Japan

CA-3:IL03 **Environmentally Benign Debinding Procedures for Thermoplastic Based Ceramic Processing Route**
L. GORJAN, T. LUSIOLA, D. SCHARF, **F. CLEMENS**, Empa, Materials Science and Technology, Lab. for High Performance Ceramics, Dübendorf, Switzerland

CA-3:L04 **Preparation of TiO2-Y2O3 and UO2-Y2O3 Pellets by Freeze Granulation or Slip Casting**
F. LA LUMIA, L. RAMOND, G. BERNARD-GRANGER, CEA Marcoule, Bagnols-sur-Cèze, France; C. PAGNOUX, SPCTS, Limoges, France

CA-3:L05 **Tribochemically Induced Optical Property Changes in MgO-Nanoparticle Powders**
T. SCHWAB, D. THOMELE, University of Salzburg, Salzburg, Austria; K. MCKENNA, University of York, York, UK; O. DIWALD, University of Salzburg, Salzburg, Austria

CA-3:L06 **Comparison of Different Methods for Polycrystalline Er:YAG Ceramics**
M. LAGNY, J. BOEHMLER, E. BARRAUD, S. LEMONNIER, S. BIGOTTA, M. EICHHORN, Institut franco-allemand de recherches de Saint Louis, Saint Louis, France; Y. LORGOUILLOUX, A. LERICHE, Laboratoire des Matériaux Céramiques et procédés Associés, LMCPA, Pôle universitaire de Maubeuge, Maubeuge, France

CA-3:IL07 **Multilayer Ceramic Systems by Tape Casting Process**
P.-M. GEFFROY, R. BOULESTEIX, E. BÉCHADE, T. CHARTIER, SPCTS, Université de Limoges, Limoges, France

CA-3:IL08 **Advanced Techniques for Green Body Characterization and Control of Sintered Texture**
SATOSHI TANAKA, Nagaoka University of Technology, Nagaoka Niigata, Japan

CA-3:L09 **Development of Transparent Ceramics: Understanding and Control of Microstructure**
R. STOCKY, J. BOEHMLER, S. LEMONNIER, French-German Research Institute of Saint-Louis, France; Y. LORGOUILLOUX, A. LERICHE, University of Valenciennes and Hainaut-Cambrésis, France

CA-3:L10 **In-situ Coagulation Casting of Ceramic Suspension via Dispersant Removal**
KE GAN, YANJIAO GAI, SHU YAN, YUJU LU, JINLONG YANG, State Key Laboratory of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing, China

Session CA-4
Sintering

CA-4:IL01 **On the Role of the Electric Field on the Sintering of Oxide Ceramics**
O. GUILLON, Forschungszentrum Juelich, Juelich, Germany

CA-4:IL02 **Discrete Element Simulation of Sintering**
D. JAUFFRES, **C.L. MARTIN**, Univ. de Grenoble Alpes, CNRS, Grenoble-INP, SIMaP, Grenoble, France; A. LICHTNER, Dept. of Mat. Sci. and Eng., University of Washington, Seattle, Washington, USA; R.K. BORDIA, Dept. of Mat. Sci. and Eng., Clemson University, Clemson, South Carolina, USA; J. VILLANOVA, ESRF, The European Synchrotron CS 40220, Grenoble Cedex, France

CA-4:IL03 **Microstructural Control and Characterization of Dense and Porous Ceramics**
W. PABST, T. UHLIROVA, V. NECINA, E. GREGOROVA, Department of Glass and Ceramics, University of Chemistry and Technology, Prague, Czech Republic

CA-4:IL04 **Fabrication of Silicon Carbide Ceramics and Aluminum Nitride Composites by Liquid Phase Sintering in SPS Process**
JUNICHI HOJO, Kyushu University, Faculty of Engineering, Fukuoka, Japan

CA-4:IL05 **Comparison of Hot Pressing and Pulsed Electric Current Sintering of ED Machinable Ceramics**
F. KERN, U. SCHMITT-RADLOFF, A. GOMMERINGER, R. GADOW, Universität Stuttgart - IFKB, Stuttgart, Germany

CA-4:L06 **Analysis of Densification Kinetics Depending on Grain Growth for Zirconia**
BYUNG-NAM KIM, KOJI MORITA, HIDEHIRO YOSHIDA, JI-GUANG LI, National Institute for Materials Science, Japan; HIDEAKI MATSUBARA, Tohoku University, Japan

CA-4:IL07 **Sintering of Tailored Pore-Grain Structures: Multi-Scale Analysis**
E.A. OLEVSKY, San Diego State University, San Diego, CA, USA

CA-4:L08 **Presentation of Two Different Approaches to Elaborate Transparent Ceramics for LASER and Ballistic Protection Applications**
C. GAJDOWSKI[1,2], M. LAGNY[1,2], R. STOCKY[1,2], A. KATZ[1,2], **J. BÖHMLER**[1], Y. LORGOUILLOUX[2], S. LEMONNIER[1], E. BARRAUD[1], S. BIGOTTA, A. LERICHE[2], M. EICHHORN[1], [1]Institut franco-allemand de recherches de Saint-Louis, Saint-Louis, France; [2]Laboratoire des Matériaux Céramiques et Procédés Associés, Boulevard Charles de Gaulle, Maubeuge, France

CA-4:L09 **Two-Step Sintering Effects on the Properties of Pressureless-Sintered Ceramics**
F. MAZZANTI, F. BEZZI, P. FABBRI, S. GRILLI, G. MAGNANI, E. SALERNITANO, M. SCAFÈ, ENEA SSPT-PROMAS-TEMAF, Laboratory of Materials Technologies Faenza, Faenza (RA), Italy

CA-4:IL10 **Processing of Dental Zirconia: How to Play on the Trade-off between Aesthetics, Mechanical Properties and Long-term Stability?**
J. CHEVALIER, FEI ZHANG, H. REVERON, E. CAMPOSILVAN, L. GREMILLARD, University of Lyon, UMR CNRS 5510 (MATEIS), INSA de Lyon, France

CA-4:L11 **Thin Water Films on Nanocrystalline Oxides: Influence on Particle Coarsening, Coalescence and Grain Morphology Evolution**
O. DIWALD, D. THOMELE, Department of Chemistry and Physics of Materials, University of Salzburg, Salzburg, Austria; A. GHEISI, Department of Chemical and Bioengineering, Friedrich-Alexander-University Erlangen-Nürnberg, Erlangen, Germany; J. BERNARDI, University Service Center for Transmission Electron Microscopy, Vienna University of Technology, Vienna, Austria; H. GRÖNBECK, Department of Physics and Competence Centre for Catalysis, Chalmers University of Technology, Gothenburg, Sweden

CA-4:L12 **Sintering and Viscous Behavior of a Low Temperature Co-fired Ceramic (LTCC) - From Experimental Characterization to Numerical Simulation of Co-sintering**
A. HEUX[1], G. ANTOU[1], N. DELHOTE[2], N. PRADEILLES[1], A. MAITRE[1], [1]Univ. Limoges, CNRS, SPCTS, UMR 7315, France; [2]Univ. Limoges, CNRS, XLIM, UMR 7252, France

CA-4:L13 **Ultrastrong Zirconia Ceramics Fabricated by an Oscillatory Pressure Sintering Process**
TIANBIN ZHU[1,2,3], ZHIPENG XIE[3], YAWEI LI[1,2], [1]The State Key Laboratory of Refractories and Metallurgy, Wuhan University of Science and Technology, Wuhan, China; [2]National-provincial Joint Eingineering Research Center of High Temperature Materials and Lining Technology, Wuhan University of Science and Technology, Wuhan, China; [3]State Key Laboratory of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing, China

Session CA-5
Innovation in Manufacturing Technology

CA-5:IL01 **Ceramic-Thermoplastic 3D Direct Write Printing for Additive Manufacturing**
C.B. DiANTONIO, A. COOK, T. CHAVEZ, L. EVANS, W. REINHOLTZ, K. MEYER, Sandia National Laboratories, Albuquerque, New Mexico, USA

CA-5:IL02 **High Performance of Ceramics and Manufacturing Process Innovation**
YOSHIO SAKKA, National Institute for Materials Science, Japan Science and Technology Agency, Tsukuba, Japan

CA-5:IL03 **Challenges in Scaling up Zirconia-based Bioceramics: From the Development of a Material at the Laboratory Scale to an Effective Industrial Production**
H. REVERON[1], FEI ZHANG[1], M. FORNABAIO[2], P. PALMERO[2], L. MONTANARO[2], T. FÜRDERER[3], N. COURTOIS[4], J. CHEVALIER[1], [1]Université de Lyon-INSA de Lyon, MATEIS CNRS UMR 5510, Villeurbanne Cedex, France; [2]Department of Applied Science and Technology, INSTM R.U. PoliTO, LINCE Lab., Politecnico di Torino, Torino, Italy; [3]DOCERAM, MOESCHTER GROUP Holding GmbH & Co. KG, Dortmund, Germany; [4]Anthogyr SAS, Sallanches, France

CA-5:IL04 **Advanced Ceramic Processing with External Magnetic Field**
TOHRU S. SUZUKI, Ceramics Processing Group, Research Center for Functional Materials, National Institute for Materials Science, Tsukuba, Japan

CA-5:IL05 **Machining Techniques to Prepare Complicated Shape Parts with Extremely Fine Details**
F. PETIT, Belgian Ceramic Research Centre, Mons, Belgium

CA-5:L06 **Polymer - spinel Nanocomposites for Applications in Modern Sensors and Actuators**
E. MARKIEWICZ, K. CHYBCZYNSKA, Institute of Molecular Physics PAS, Poznan, Poland; A. GRZABKA-ZASADZINSKA, S. BORYSIAK, Poznan University of Technology, Poznan, Poland

SYMPOSIUM CB
NON CONVENTIONAL AND EMERGING ROUTES TO ADVANCED CERAMICS

Session CB-1
Solution-based Processing

CB-1:IL01 **From Inorganic Molecules to Functional Oxide Materials: A Liasson towards Electronic Device Applications**
S. SANCTIS, J. KRAUSMANN, R.C. HOFFMANN, **J.J. SCHNEIDER**, Eduard-Zintl-Institut für Anorganische und Physikalische Chemie, Technische Universitaet Darmstadt, Darmstadt, Germany

CB-1:IL02 **Solution Based Processing of Nanotitania Allotropes and their Applications in Energy and Environment**
S. CASSAIGNON, Sorbonne University (UPMC), Chimie de la Matière Condensée de Paris, CNRS UMR7574, Paris, France

CB-1:L03 **Gallium-based Oxynitride Nanoparticles and their Photocatalytic Activity**
YUSUKE ASAKURA, SHU YIN, Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Sendai, Japan

CB-1:L04 **Synthesis of Nanometric Cerium Oxide-based Powders for Catalytic and Energetic Applications**
A. GONDOLINI[1], E. MERCADELLI[1], S. ALBONETTI[2], A. SANSON[1], [1]ISTEC-CNR, Faenza, Italy; [2]Department of Industrial Chemistry "Toso Montanari", University of Bologna, Bologna, Italy

CB-1:L05 **Photocatalytic Activities of Carbon-doped TiO2 Based Composites**
CHIAKI NODA, YUSUKE ASAKURA, SHU YIN, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan

Session CB-2
Polymer Derived Ceramics

CB-2:IL01 **Polymer-derived High-pressure Phases via Intermediate Amorphous Materials**
YOSHIYUKI SUGAHARA, Department of Applied Chemistry, School of Advanced Science and Engineering, Waseda University, Tokyo, Japan; Kagami Memorial Research Institute for Materials Science and Technology, Waseda University, Tokyo, Japan

CB-2:IL02 **Polymer-derived Ceramic Nanocomposites for Applications at High Temperatures and in Harsh Environments**
E. IONESCU, Darmstadt University of Technology, Institute for Materials Science, Darmstadt, Germany

CB-2:L03 **Multiple Stages of Structure Formation in Silicon Oxycarbide Ceramics**
P. KROLL, The University of Texas at Arlington, Arlington, TX, USA

CB-2:L04 **Molecular Route Syntheses of Inorganic C-N Compounds in Ultra-high Pressure and Temperature**
MASASHI HASEGAWA, KEN NIWA, TOSHIFUMI FUKAI, YUKI JIN, Department of Materials Physics, Nagoya University, Nagoya, Japan

CB-2:IL05 **Boron Nitride Based Nanostructured Materials for Energy, Environmental and Health Applications**
P. MIELE, Institut Européen des Membranes (IEM-UMR 5635 ENSCM, UM, CNRS), Ecole Nationales Supérieure de Chimie de Montpellier & Institut Universitaire de France, Montpellier, France

CB-2:L06 **Synthesis of Fluorinated Polysilazanes and their Application as Protective Hydrophobic Coatings**
P. FURTAT, G. MOTZ, Department of Ceramic Materials Engineering, Bayreuth University, Bayreuth, Germany; R. MACHADO, Department of Chemical Engineering, Federal University of Santa Catarina, Florianopolis, Brazil

CB-2:L07 **Novel Glass-ceramics from Glass Powders and Reactive Preceramic Polymer Binders**
H. ELSAYED[1, 2], E. BERNARDO[1], [1]Department of Industrial Engineering, University of Padova, Italy; [2]Ceramics Department, National Research Centre, El-Bohous Street, Cairo, Egypt

CB-2:L08 **Generation and Control of Microporosity in Polymer-derived SiCN Ceramics**
C. DRECHSEL, T. KONEGGER, Institute of Chemical Technologies and Analytics, TU Wien, Vienna, Austria

CB-2:L09 **Molecular Design of Novel 0D, 1D and 2D Nanocarbon-based Ceramic Composites**
G. MERA, R. RIEDEL, TU Darmstadt, Institute for Materials Science, Darmstadt, Germany

Session CB-3
Microwave Processing

CB-3:IL01 **Materials Processing under Microwave Non-equilibrium Reaction Field**
HIROTSUGU TAKIZAWA, Tohoku University, Sendai, Japan

CB-3:IL02 **Microwave Versus Conventional Sintering of Pure and TiO2 doped MgAl2O4 Ceramics: Sintering Trajectory and Mechanisms**
S. MARINEL[1], R. MACAIGNE[1], D. GOEURIOT[2], S. SAUNIER[2], [1]CRISMAT Laboratory, University of Caen Normandy, France; [2]Ecole des Mines de Saint-Etienne, Dép. Science des Matériaux et des Structures, Saint-Etienne, France

CB-3:L03 **Microwave Technology for Commercial Scale Processing of Ceramic Materials**
P. APTE, Harper International, Buffalo, NY, USA; G. BUNCE, Ferrite Microwave Technologies, Nashua, NH, USA

CB-3:IL04 **In Situ and Ex Situ Characterization of Microwave-assisted Synthesis of Functional Oxide Nanoparticles**
L. TINAT, E. CAZYUS-CLAVERIE, D. PORTEHAULT, C. CHANEAC, **O. DURUPTHY**, Laboratoire de Chimie de la Matière Condensée de Paris, UPMC Sorbonne Universités, Paris, France

CB-3:IL05 **Electromagnetic Field Effects in High-temperature Microwave Processing of Materials**
K.I. RYBAKOV, Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russia, and Advanced School of General and Applied Physics, Lobachevsky State University of Nizhny Novgorod, Russia

Session CB-4
Electrical Field and Pressure Assisted Synthesis and Sintering

CB-4:IL01 **Spark Plasma Sintering Mechanisms of Zirconium Oxycarbides and Alumina**
A. MAITRE, G. ANTOU, N. PRADEILLES, Lab. SPCTS, CEC, Limoges, France

CB-4:IL02 **Ultra-high Pressure Synthesis of New Nitrides**
KEN NIWA, MASASHI HASEGAWA, Nagoya University, Nagoya, Japan

CB-4:L03 **Low Temperature Development of Calcium Sialons along the Alpha/(alpha+beta) Phase Boundary using Nano-size Oxi-nitride Precursors and Spark Plasma Sintering Technique**
B.A. AHMED, A.S. HAKEEM, **T. LAOUI**, King Fahd University of Petroleum and Minerals (KFUPM) Dhahran, Saudi Arabia

CB-4:L04 **Spark Plasma Sintering and Flash Sintering of Non-Stoichiometric Oxides**
M. COLOGNA, D. MANARA, M. HOLZHAUSER, C. BOSHOVEN, European Commission, Joint Research Centre (JRC), Karlsruhe, Germany; V. TYRPEKL, Charles University in Prague, Faculty of Science, Praha 2, Czech Republic

CB-4:IL05 **Flash Sintering of Alumina and other Oxide Ceramics**
V.M. SGLAVO, M. BIESUZ, Department of Industrial Engineering, University of Trento & INSTM, Florence, Italy

CB-4:IL06 **Spark Plasma Sintering of ceramics: From Controlling the Microstructures to the Development of Complex Shapes**
C. MANIERE[1], G. CHEVALLIER[1], L. DURAND[2], F. AHMAD[1], G. CHEVALLIER[1], A. WEIBEL[1], F. MAUVY[3], R. EPHERRE[1], C. ELISSALDE[3], M. MAGLIONE[3], **C. ESTOURNES**[1], [1]CIRIMAT, Université de Toulouse, CNRS, UT3, INPT, Toulouse Cedex, France; [2]CEMES, Univ. Toulouse, CNRS, Toulouse Cedex, France; [3]ICMCB, CNRS UPR 9048, Université Bordeaux, Pessac, France

CB-4:L07 **Sintering Behavior of Zinc Oxide under DC field by EDXRD**
H. BICER, Dumlupınar University, Kütahya, Turkey; B. BEYOGLU, T. OZDEMIR, T. TSAKALAKOS, Rutgers University, NJ, USA; J. OKASINSKI, Argonne National Laboratory, Lemont, IL, USA

CB-4:IL08 **High Pressure Synthesis and Crystal Growth of BN and Related Materials**
TAKASHI TANIGUCHI, National Institute for Materials Science, Tsukuba, Japan

CB-4:L09 **Effect of DC Current on Creep behavior of 8Y-ZrO2**
KOJI MORITA, BYUNG-NAM KIM, HIDEHIRO YOSHIDA, KEIJIRO HIRAGA, YOSHIO SAKKA, National Institute for Materials Science, Tsukuba, Japan

Session CB-5
Functionally Graded Materials

CB-5:IL01 **Metal-ceramics Functionally Graded Materials**
YOSHIMI WATANABE, Nagoya Institute of Technology, Nagoya, Japan

CB-5:IL02 **MAX Phase Reinforced SiC/SiC Composites**
XIAOWEI YIN, LAIFEI CHENG, LITONG ZHANG, Northwestern Polytechnical University, Xi'an, China

CB-5:L03 **Analysis of FGM Beam Model for Thermal Stability Behavior with Heat Conduction Effect**
YOUNG-HOON LEE, TAE-KYUNG LIM, JI-HWAN KIM, Department Mechanical and Aerospace Engineering, College of Engineering, Seoul National University, Seoul, South Korea

Session CB-6
Other Non Traditional or Novel Routes

CB-6:IL01 **Novel Colloidal Syntheses in Molten Salts Toward Complex Nanoparticles**
D. PORTEHAULT, Sorbonne Universités, UPMC Univ Paris 06, CNRS, Collège de France, Laboratoire de Chimie de la Matière Condensée de Paris, Paris, France

CB-6:IL02 **High Temperature Adhesives Derived from SiBCN Precursors**
SUN CHANG, JIANQIANG WANG, **XINGANG LUAN**, LAIFEI CHENG, Science and Technology on Thermostructural Composite Materials Laboratory, Northwestern Polytechnical University, Xi'an, China

CB-6:L03 **Hybrid Simulations of Formation of Nanocomposite Materials with a Scaffold of Carbon Nanotubes and Boron Carbide Matrix by Means of Chemical Vapor Infiltration Technique**
A.N. VOLKOV, Department of Mechanical Engineering, University of Alabama, Tuscaloosa, AL, USA

CB-6:L04 **Effect of Gold Nanoparticles on Corrosion Behavior of Melting Gel Coatings on Stainless Steel**
L.C. KLEIN[1], S. KALLONTZI[1], L. FABRIS[1], A. ARPINO[1], A. JITIANU[2, 3], J. MOSA[4], M. APARICIO[4], [1]Rutgers University, Department of Materials Science and Engineering, Piscataway, NJ, USA; [2]Department of Chemistry, Davis Hall, Lehman College-CUNY, Bronx, NY, USA; [3]Chemistry Program, The Graduate Center, The City University of New York, New York, NY, USA; [4]Instituto de Cerámica y Vidrio-CSIC, Campus de Cantoblanco, Madrid, Spain

CB-6:IL05 **Combining Top-down and Bottom-up Approaches Towards Bio-inspired, Multi-functional Materials for Photonics and Nanofluidics**
M. FAUSTINI, Université Pierre et Marie Curie/CNRS/College de France, Paris, France

CB-6:IL06 **Electrospinning of Mesoporous Ceramic Nanofibers**
O. ELISHAV[1], V. BEILIN[2], G.E. SHTER[2], **G.S. GRADER**[2], [1]The Nancy and Stephen Grand Technion Energy Program, Technion I.I.T, Haifa, Israel, [2]The Wolfson Department of Chemical Engineering, Technion I.I.T, Haifa, Israel

CB-6:L07 **Synthesis of Nano-carbons and Nano-Ilmenites using Super-High-Energy Ball Milling**
SATOSHI OHARA, Joining and Welding Research Institute, Osaka University, Ibaraki, Japan

CB-6:L08 **The Film Boiling Chemical Vapor Infiltration for the Elaboration of Oxide/Oxide Composites**
C. BESNARD, L. MAILLE, Université de Bordeaux, LCTS, Lab. des Composites ThermoStructuraux, CNRS, CEA, SAFRAN, Pessac, France; P. DAVID, CEA Le Ripault, Commissariat à l'Energie Atomique, Monts, France; A. ALLEMAND, CEA Le Ripault, Commissariat à l'Energie Atomique, Monts, France and Université de Bordeaux, LCTS, Lab. des Composites ThermoStructuraux, CNRS, CEA, SAFRAN, Pessac, France

CB-6:IL09 **Environmental Friendly Process for Inorganic Functional Ceramics**
SHU YIN, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan

CB-6:IL10 **Alternative Methods of Synthesis of Calcium Silicates**
N. BETANCUR, J.C. RESTREPO, **O.J. RESTREPO**, Cement and Buiilding Materilas Group of Research. School of Mines, Universidad Nacional de Colombia, Medellin, Colombia

Focused Session CB-8
BIO-INSPIRED AND BIO-ENABLED PROCESSING

Session CB-8.1
Self-assembly, mineralization and hierarchical organization; hybrid structures

CB-8.1:IL01 **Designed Construction of Nanostructured Inorganic and Hybrid Materials: Similarities between Natural & Synthetic Approaches**
C. SANCHEZ, Collège de France, Lab. de Chimie de la Matière Condensée de Paris, CNRS, Université Pierre et Marie Curie, Paris, France

CB-8.1:IL02 **Protein-based Functionalization of Diatom Biosilica**
N. KROEGER, E. KUMARI, N. DUBEY, G. BEGUM, B CUBE Center for Molecular Bioengineering, Dresden University of Technology, Dresden, Germany

CB-8.1:L03 **Processing of Bulk Supercrystalline Nacre-mimetics with Enhanced Mechanical Properties**
D. GIUNTINI, B. DOMENECH, B. BOR, D. BENKE, G.A. SCHNEIDER, Institute of Advanced Ceramics, Hamburg University of Technology, Hamburg, Germany

CB-8.1:IL04 **Chemical Transformation of Sustainable 3-D Microscale Biogenic Structures into High-Fidelity Replicas Comprised of Multicomponent Functional Synthetic Materials**
K.H. SANDHAGE, School of Materials Engineering, Purdue University, West Lafayette, IN, USA

CB-8.1:IL05 **Designing Hierarchical Rare Earth Nanoceramics for Biomedical Applications**
S. SEAL, Materials Science & Eng, Advanced Materials Processing Analysis Center, Nanoscience Technology Center, College of Medicine, University of Central Florida, Orlando, Fl, USA

CB-8.1:L06 **Nonclassical Crystallization in Vivo: A Fundamental Process-structure-property Relationship in Biominerals and New Synthesis Pathway to Bioinspired Nanoceramics and Gradient Materials**
S.E. WOLF, Institute for Glass and Ceramics, Friedrich-Alexander-University Erlangen-Nürnberg, Erlangen, Germany

CB-8.1:L07 **Bioprocess Inspired Synthesis of Functional Materials**
HAO XIE[1, 2], Zheng-Yi Fu[1], [1]State Key Lab of Advanced Technology for Materials Synthesis and Processing; [2]School of Chemistry, Chemical Engineering, and Life Science, Wuhan University of Technology, Wuhan, China

CB-8.1:L08 **Hierarchical Nanocomposites: From Self-assembly of Nanoparticles to Mechanical Properties**
B. DOMENECH, D. GIUNTINI, B. BOR, D. BENKE, G.A. SCHNEIDER, Institute of Advanced Ceramics, Hamburg University of Technology, Hamburg, Germany

Session CB-8.2
Structure and Mechanics of Bioinspired Materials

CB-8.2:IL01 **Strain-rate Dependent Deformation Mechanism of Bioinspired Graphene-Al Nanolaminated Composites**
QIANG GUO, LEI ZHAO, ZAN LI, ZHIQIANG LI, GENLIAN FAN, DING-BANG XIONG, YISHI SU, DI ZHANG, State Key Lab of Metal Matrix Composites, Shanghai Jiao Tong University, Shanghai, China

CB-8.2:IL02 **High-throughput Bioengineering of Novel Nanostructures by Genetic Manufacturing on Insect Corneal Surfaces: Looking for Applications**
V. KATANAEV, University of Lausanne, Lausanne, Switzerland

CB-8.2:L03 **Mechanical properties and constitutive behavior of 3-D Supercrystalline Nanocomposites**
B. BOR, D. GIUNTINI, B. DOMÈNECH, D. BENKE, G.A. SCHNEIDER, Institute of Advanced Ceramics, Hamburg University of Technology, Hamburg, Germany

CB-8.2:IL04 **Architecture and Interface Design for Multifunctional Graphene/Copper Matrix Composites**
DING-BANG XIONG, MU CAO, ZHIQIANG LI, DI ZHANG, State Key Laboratory of Metal Matrix Composites, Shanghai Jiao Tong University, Shanghai, China

CB-8.2:IL05 **Impact Tolerant Biocomposites**
D. KISAILUS, Materials Science and Engineering, and Department of Chemical and Environmental Engineering, University of California Riverside, CA, USA

CB-8.2:IL06 **Flake Powder Metallurgy: a Bioinspired Pathway to Aluminum Nanocomposites with Nacre-like Structure**
ZHIQIANG LI, GENLIAN FAN, ZHANQIU TAN, DINGBANG XIONG, QIANG GUO, YISHI SU, DI ZHANG, Shanghai Jiao Tong University, Shanghai, China

Session CB-8.3
Bioinspired Functional Surfaces

CB-8.3:IL01 **Bioactive and Antimicrobial Biofilm Ceramic Surfaces Synthesized by Advanced Pulsed Laser Technologies**
I.N. MIHAILESCU[1], C. RISTOSCU[1], A. BIGI[2], [1]National Institute for Lasers, Plasma and Radiation Physics, Magurele, Ilfov, Romania; [2]Department of Chemistry "G. Ciamician", University of Bologna, Bologna, Italy

CB-8.3:L02 **Flexible and Superhydrophobic Vulcanized Rubber Microstructures**
YUJI HIRAI[1], RIKU TAMURA[1], MASATSUGU SHIMOMURA[1], YASUTAKA MATSUO[2], TAKAHIRO OKAMATSU[3], TOSHIHIKO ARITA[4], [1]Chitose Institute of Science and Technology, Chitose, Hokkaido, Japan; [2]RIES, Hokkaido university, Sapporo, Hokkaido, Japan; [3]THE YOKOHAMA RUBBER CO., LTD, Hiratsuka, Kanagawa, Japan; [4]IMRAM, Tohoku university, Sendai, Miyagi, Japan

CB-8.3:L03 **Development and Characterization of Bioinspired Functional Coating on Different Substrates**
R. TEJIDO-RASTRILLA, G. BALDI, Colorobbia Consulting s.r.l., Sovigliana, Vinci, Florence, Italy; R. DETSCH, A.R. BOCCACCINI, Institute of Biomaterials, University of Erlangen-Nuremberg, Erlangen, Germany

Session CB-8.4
Bioinspired Materials for Biomedical Applications

CB-8.4:IL01 **Multifunctionalized Calcium Phosphates with Anti-resorptive, Anti-Inflammatory and Anti-bacterial Properties**
E. BOANINI, Department of Chemistry "Ciamician", University of Bologna, Italy

CB-8.4:IL02 **Major Advances in 2D Ceramic Hybrid Materials in Nanomedicine: Challenges and Future Directions**
JIN-HO CHOY, Center for Intelligent Nano-Bio Materials (CINBM), Department of Chemistry and Nano Science, Ewha Womans University, Seoul, South Korea

CB-8.4:L03 **Hydroxyapatite Scaffolds Derived from deer Antler**
L. GONZALEZ-RODRIGUEZ, S. ASTRAY, B.M. HIDALGO-ROBATTO, E. SOLLA, M. LOPEZ-ALVAREZ, J. SERRA, **P. GONZALEZ,** New Materials Group, Applied Physics Dpt., IISGS, University of Vigo, Spain

CB-8.4:L04 **Boron Neutron Capture Therapy Assisted by Drug Delivery System**
GOEUN CHOI, JIN-HO CHOY, Center for Intelligent Nano-Bio Materials (CINBM), Department of Chemistry and Nano Science, Ewha Womans University, Seoul, South Korea

Session CB-8.5
Application and Performance of Bioinspired Materials

CB-8.5:IL01 **A Highly Sensitive, Reproducible and Uniform SERS Substrate with 3-dimensional Distributed Hotspots of High Density: Gyroid-structured Au Periodic Metallic Materials**
DI ZHANG, WANG ZHANG, Department of Materials Science and Engineering, Shanghai Jiao Tong University, Shanghai, China

CB-8.5:IL02 **Engineering 3D Distributed Plasmonic Nanogaps in Gyroid-structured Periodic Metallic Materials**
WANG ZHANG, LIPING WU, PENG SUN, DI ZHANG, Department of Materials Science and Engineering, Shanghai Jiao Tong University, Shanghai, China

Focused Session CB-9
ADDITIVE MANUFACTURING

Session CB-9.1
Selective Laser Sintering

CB-9.1:IL01 **How to Process Ceramics by Laser Beam Melting?**
E. JUSTE, BCRC, Mons, Belgium

CB-9.1:IL02 **Powder-based Additive Manufacturing at Micro-gravity**
J. GUENSTER, A. ZOCCA, P. LIMA, J. LÜCHTENBORG, Bundesanstalt für Materialforschung und –prüfung (BAM), Berlin, Germany; T. MÜHLER, Clausthal University of Technology (TUC), Clausthal-Zellerfeld, Germany; M. SPARRENBERG, J. MELCHER, Deutsches Zentrum für Luft- und Raumfahrt (DLR), Braunschweig, Germany

CB-9.1:IL03 **Laser Sintering of Ceramics**
TEIICHI KIMURA, Japan Fine Ceramics Center, Nagoya, Japan

CB-9.1:IL04 **Alumina Refractory Ceramic Molds Processed by SLM**
D. DESCHUYTENEER, Belgian Ceramic Research Centre, Mons, BELGIUM

CB-9.1:L05 **Additive Manufacturing of Geopolymers by Local Laser Curing**
P. HLAVACEK[1], T. MUEHLER[2], J. LUECHTENBORG[1], P. STURM[1], G.J.G. GLUTH[1], H.-C. KUEHNE[1], J. GUENSTER[1, 2], [1]Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany; [12]TU Clausthal, Clausthal-Zellerfeld, Germany

Session CB-9.2
Laminated Object Manufacturing

CB-9.2:IL01 **Laminated Object Manufacturing of Ceramic-based Composites**
N. TRAVITZKY, University of Erlangen-Nuremberg, Dept. of Materials Science, Glass and Ceramics, Erlangen, Germany

CB-9.2:IL02 **3D-printing of Organic-inorganic Hybrid Microstructures**
P. BELLEVILLE, CEA Le Ripault, Monts, France

CB-9.2:L03 **Additive Manufacturing of AlN Based UV-curable Dispersions**
P. OZOG[1, 2], D. KATA[2], T. GRAULE[1], [2]Laboratory for High Performance Ceramics, Empa, Dübendorf, Switzerland; [2]Faculty of Materials Science and Ceramics, University of Science and Technology, Cracow, Poland

Session CB-9.3
Fused Deposition Modelling

CB-9.3:IL01 **Thermoplastic- and Suspension-based Additive Manufacturing of Multi-material Components**
U. SCHEITHAUER, E. SCHWARZER, S. WEINGARTEN, J. ABEL, H.-J. RICHTER, T. MORITZ, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden, Germany

CB-9.3:IL02 **Materials and Processing Hybridization by Advanced Thermoplastic Additive Manufacturing**
T. MORITZ, U. SCHEITHAUER, J. ABEL, A. MUELLER-KOEHN, A. GUENTHER, S. WEINGARTEN, A. MICHAELIS, Fraunhofer IKTS, Dresden, Germany

CB-9.3:IL03 **Additive Manufacturing meets Tissue Engineering: Biofabrication with Hydrogels and Bioactive Glasses**
A. BOCCACCINI, University of Erlangen-Nuremberg, Erlangen, Germany

CB-9.3:L04 **Ethylene Vinyl Acetate as a Binder for Fused Deposition Modelling of Ceramic**
L. GORJAN[1], L. REIFF[1, 2], A. LIERSCH[2], F. CLEMENS[1], [1]Empa - Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland; [2]Department of Materials Engineering, Glass and Ceramics, Hochschule Koblenz, Germany

Session CB-9.4
Stereolithography

CB-9.4:IL01 **Microstereolithography Applied to Biomedical Devices**
A. LERICHE, M. DEHURTEVENT, S. CHAMARY, H. CURTO, A. THUAULT, J.C. HORNEZ, Laboratoire des Matériaux Céramiques et Procédés Associés, Université de Valenciennes, Maubeuge, France; F. PETIT, F. CAMBIER, Belgian Ceramic Research Centre, Mons, Belgium; M.H. FERNANDEZ, Laboratory for Bone Metabolism and Regeneration, Universidade do Porto, Portugal; F. MONTEIRO, INEB, Universidade do Porto, Portugal

CB-9.4:IL02 **Printing and Characterization of Dense Oxide Ceramics using Lithographic AM**
J. VOGT, T. MARTINI, M. STEPANYAN, Fraunhofer Center for High-Temperature Materials and Design (HTL), Bayreuth, Germany

CB-9.4:IL03 **Stereolithographic Additive Manufacturing of Ceramic Groove Chambers for Stream Lines Modulations of Energy and Material Flows**
SOSHU KIRIHARA, Osaka University, Joining and Welding Research Institute, Osaka, Japan

CB-9.4:IL04 **Future Advanced Ceramic Materials with Triple Periodic Minimal Surface Topology**
V.Ya. SHEVCHENKO, M.M. SYCHOV, S.P. BOGDANOV, L.A. LEBEDEV, Institute of Silicate Chemistry, Russian Academy of Sciences (ISC RAS), St. Petersburg, Russia

CB-9.4:L05 **Development of Ce-TZP-Al2O3 based UV Sensitive Resin for Stereolithography**
S. CAILLIET, M. ROUMANIE, R. LAUCOURNET, Université Grenoble-Alpes, Grenoble, France and CEA, LITEN, DTNM, SERE, LRVM, Grenoble, France; G. BERNARD-GRANGER, Université Grenoble-Alpes, Grenoble, France and CEA, DEN, MAR, DRMC, SFMA, DIR, Bagnols-sur-Cèze, France

CB-9.4:L06 **Development of Photo-curable Ceramic Resin with High Dispersion Stability for SLA 3D Printing Application**
SE YEON SONG[1,2], JUNG WOO LEE[1], JI SUN YUN[1], [1]Electronic Convergence Materials Division, Korea Institute of Ceramic Engineering and Technology, Jinju, South Korea; [2]Department of Materials Engineering, Pusan National University, Busan, South Korea

CB-9.4:IL07 **Additive Manufacturing: Towards Real Manufacturing Processes of Functional Ceramic Parts**
T. CHARTIER, SPCTS, CNRS/University of Limoges, Limoges, France

CB-9.4:IL08 **State of the Art in Stereolithography of Ceramics**
J. HOMA, M. SCHWENTENWEIN, Lithoz GmbH, Vienna, Austria

CB-9.4:L09 **Development of a Numerical Simulation Model for Predicting the Curing of Ceramic Systems in the Stereolithography Process**
J. TARABEUX, V. PATELOUP, P. MICHAUD, T. CHARTIER, SPCTS - UMR CNRS 7315, Limoges, France

Session CB-9.5
Direct Writing

CB-9.5:IL01 **Solvent-free Direct Deposition of Ceramic Components for Energy Application**
HIROYA ABE, Osaka University, Ibaraki, Japan

CB-9.5:L02 **Aerosol Jet® Technology for Printed Electronic Devices Comprising Ceramics**
M.A. PIECHOWIAK[1], G. ETCHEGOYEN[1], A. DELAGE[2], N. DELHOTE[2], A. ABDELGHANI[2], [1]Centre de Transfert de Technologies Céramiques (CTTC), Limoges Cedex, France; [2]Laboratoire XLIM - UMR CNRS 7252 - Université de Limoges, Limoges Cedex, France

CB-9.5:L03 **Direct 3D Printing of Aluminum Nitride Using Ovalbumin As The Natural Binder**
WAI HOONG KOK[1], K.C. YUNG[1], T.C. ANG[2], [1]Department of Industrial and Systems Engineering, Faculty of Engineering, The Hong Kong Polytechnic University, Hong Kong; [2]School of Material Science, Nanyang Technolgy University, Singapore

Session CB-9.6
Other/Emerging AD Routes

CB-9.6:IL01 **Layerwise Slurry Deposition for Additive Manufacturing of Ceramics**
A. ZOCCA, P. LIMA, J. LÜCHTENBORG, J. GUENSTER, BAM Federal Institute for Materials Research and Testing, Berlin, Germany; T. MUEHLER, Clausthal University of Technology, Clausthal Zellerfeld, Germany

CB-9.6:L02 **Additive Manufacturing of Dense and Adherent Ceramic Coatings by Powder Deposition without Sintering**
O. DURAND-PANTEIX, F. BERTHOIX, G. ETCHEGOYEN, Centre de Transfert de Technologies Céramiques (CTTC), Limoges Cedex, France

CB-9.6:L03 **Additive Manufacturing of Dense Ceramics with Laser Induced Slip Casting (LIS)**
J. LUECHTENBORG, A. ZOCCA, J. GUENSTER, Federal Institute for Materials Research and Testing (BAM), Division 5.4 - Ceramic Processing and Biomaterials, Berlin, Germany; T. MUEHLER, Clausthal University of Technology (TUC), Institute of Non-Metallic Materials, Clausthal-Zellerfeld, Germany

CB-9.6:L04 **Acoustophoretic Printing for Ceramic Suspensions**
D. FORESTI, B. ROMAN-MANSO, J.A. LEWIS, Wyss Institute for Biologically Inspired Engineering at Harvard John A. Paulson School of Engineering and Applied Science, Cambridge, MA, USA

CB-9.6:IL05 **Laser-based Additive Manufacturing for Medical Applications**
R.J. NARAYAN, UNC/NCSU Joint Department of Biomedical Engineering, Raleigh, NC, USA

CB-9.6:IL06 **Creation of Dense Technical Ceramics by Powder Bed Three Dimensional Printing**
P. GINGTER, A. LYNEN, J. HEYM, Schunk Ingenieurkeramik GmbH, Willich-Münchheide, Germany

CB-9.6:L07 **Digital Printing of Glass-ceramic Glazes**
M. CANNIO[1], D.N. BOCCACCINI[1], V. RIVA[1], M. HANUSKOVA[1], M. ROMAGNOLI[1], R. TAURINO[2], F. BONDIOLI[2], M. TOGNETTI[3], M. CICCONI[4], T. FEY[4], V. NOVARESIO[5], A. R. BOCCACCINI[6], [1]Dipartimento di Ingegneria Enzo Ferrari, Università di Modena e Reggio Emilia, Italy; [2]Dipartimento di Ingegneria e Architettura, Università di Parma, Italy; [3]Daxel S.r.l., Rubiera RE, Italy; [4]Institute of Glass and Ceramics, Department of Materials Science and Engineering, University of Erlangen-Nuremberg, Erlangen, Germany; [5]ALLOVIS Engineering, Torino, Italy; [6]Institute of Biomaterials, Department of Materials Science and Engineering, University of Erlangen-Nuremberg, Erlangen, Germany

Focused Session CB-10
SHS CERAMICS

Session CB-10.1
Theory and Modeling of SHS Processes and Structural Transformations

CB-10.1:IL01 **Concurrent and Complementary Methods in the Theory of SHS: Partial Differential Equations vs Molecular Dynamics**
F. BARAS, Laboratoire ICB, CNRS-Université Bourgogne Franche-Comté, Dijon, France

CB-10.1:IL02 **Modeling of SHS with a Transient Melt using the Kolmogorov-Avrami-Johnson-Mehl Approach**
B.B. KHINA, Physico-technical Institute, National Academy of Sciences of Belarus, Minsk, Belarus

CB-10.1:IL03 **A Molecular Dynamics Simulation of SHS in Nanofoils**
O. POLITANO, Laboratoire ICB UMR 6303 CNRS-Universite de Bourgogne, Dijon Cedex, France

CB-10.1:IL04 **Influence of Mechanical Activation on Microstructure, Reactivity and Kinetic Parameters of SHS-mixtures**
A.S. ROGACHEV, Merzhanov Institute of Structural Macrokinetics and Materials Science (ISMAN), Chernogolovka Moscow region, Russia

Session CB-10.2
SHS of Powders from the Micro- to Nano-scale. Consolidation of the SHS-powders

CB-10.2:IL01 **Ultra-refractory Ceramics by Combination of SHS and SPS: Recent Advances**
R. ORRU', G. TALLARITA, R. LICHERI, G. CAO, Dipartimento di Ingegneria Meccanica, Chimica e dei Materiali, Università degli Studi di Cagliari, Cagliari, Italy

CB-10.2:L02 **Design, Combustion Synthesis and Consolidation of the Borides in Zr-Ta-B System**
V.V. KURBATKINA, E.I. PATCERA, E.A. LEVASHOV, National University of Science and Technology "MISIS", Moscow, Russia

CB-10.2:L03 **NiO and WO3 Coreduction by Combined Reducers Mg/C and Preparation of W-Ni Alloy**
M.K. ZAKARYAN[1,2], S.V. AYDINYAN[3], S.L. KHARATYAN[1,2], [1]A.B. Nalbandyan Institute of Chemical Physics NAS RA, Yerevan, Armenia; [2]Yerevan State University, Yerevan, Armenia; [3]Tallinn University of Technology, Tallinn, Estonia

CB-10.2:L04 **Mechanically Activated SHS in Ta-Si-C System**
S. VOROTILO, E.A. LEVASHOV, National University of Science and Technology "MISiS", Moscow, Russia

CB-10.2:IL05 **Contribution of SHS in Development and Production of Super-refractory Ceramic Materials**
E.A. LEVASHOV, YU.S. POGOZHEV, V.V. KURBATKINA, I.V. IATSYUK, YU.YU. KAPLANSKII, S. VOROTILO, National University of Science and Technology "MISIS", Moscow, Russia

CB-10.2:L06 **Selective Laser Melting of Ti-B-Si System produced by SHS**
S.V. AYDINYAN, L. LIU, I. HUSSAINOVA, Tallinn University of Technology, Tallinn, Estonia

CB-10.2:L07 **MoSi2 based Composites Preparation by Combustion Synthesis with Subsequent Selective Laser Sintering**
T. MINASYAN[1], M.A. RODRIGUEZ[2], LE LIU[1], M. AGHAYAN[1], L. KOLLO[1], I. HUSSAINOVA[1,3,4], [1]Tallinn University of Technology, Tallinn, Estonia; [2]Instituto de Ceramica y Vidrio (ICV-CSIC), Madrid, Spain; [3] ITMO University, St. Petersburg, Russia; [4]University of Illinois at Urbana-Champaign, Department of Mechanical Science and Engineering, Urbana, IL, USA

Session CB-10.3
SHS of Bulk Materials

CB-10.3:IL01 **Hot Shock Welding Applications for Layered Composite Consisting of Non-oxide Ceramics and Metal**
RYUICHI TOMOSHIGE, KANAKO SONODA, TAKUMI NAKAMURA, TAKUMA TANAKA, Sojo University, Japan; SEIICHIRO II, National Institute for Materials Science, Japan; YASUHIRO MORIZONO, National Institute of Technology, Kurume College, Japan

CB-10.3:IL02 **Recent Progress in SHS Ceramics**
A.S. MUKASYAN, Department of Chemical and Biomolecular Engineering, University of Notre Dame, Notre Dame, IN, USA, and National University of Science and Technology MISiS, Moscow, Russia

CB-10.3:IL03 **Shedding New Light on the Microstructure of SiBOC Based Ceramics**
G.D. SORARU', University of Trento, Trento, Italy

CB-10.3:L04 **Combustion Synthesis of Ti3SiC2/SiC Ceramic Matrix Composites with Multichannel Structure**
P.V. ISTOMIN, A.V. NADUTKIN, E.I. ISTOMINA, V.E. GRASS, Institute of Chemistry of Komi SC UB RAS, Syktyvkar, Russia

Session CB-10.4
Solution Combustion Synthesis of Ceramic Nanopowders and Materials, and Applications

CB-10.4:IL01 **Product Structure Formation in SCS Processes**
G. XANTHOPOULOU, Institute of Nanoscience and Nanotechnology, NCSR "Demokritos", Athens, Greece

CB-10.4:IL02 **Solution Combustion Synthesis of Nanomaterials for Various Applications**
Z.A. MANSUROV, G.T. SMAGULOVA, Institute of Combustion Problems, Kazakhstan, Almaty Al-Farabi Kazakh National University, Almaty, Kazakhstan

CB-10.4:IL03 **Branding Study on SHS Technologies toward Efficient In-situ Resource Utilization Scenario**
OSAMU ODAWARA, PROSAP Inc., Tokyo, Japan

CB-10.4:L04 **Solution Combustion Synthesis of Gadolinium Oxide Nanopowders: Influence of the Fuel on the Properties of the Material**
J. MONNIER[1], X. DESCHANELS[1], C. REY[1], E. WELCOMME[2], [1]CEA Marcoule, Institut de Chimie Séparative de Marcoule (ICSM) - LNER; [2]CEA Marcoule, ATALANTE - DMRC, France

SYMPOSIUM CC
CERAMICS AND COMPOSITES FOR ENHANCED TRIBOLOGIC AND CORROSION PERFORMANCE IN HIGH-DEMANDING APPLICATIONS

Session CC-1
Friction and Wear

CC-1:IL01 **Strategies for Developing Hard Coatings for Demanding Application**
P.H. MAYRHOFER, Materials Science and Technology, TU Wien, Vienna, Austria

CC-1:IL02 **Structured and Layered Coatings for Reduction of Wear**
DAE-EUN KIM, School of Mechanical Engineering, Yonsei University, Seoul, South Korea

CC-1:IL03 **Towards Hard yet Self-lubricious CrAlSiN Coatings**
SAM ZHANG, School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore

CC-1:IL04 **Ceramic/Carbon Nanofiller Composites: New Materials with Improved Tribological Performance**
M. BELMONTE, P. MIRANZO, M. I. OSENDI, Institute of Ceramics and Glass (ICV-CSIC), Madrid, Spain

CC-1:L05 **Hollow Spherical and Nanosheet-base BN Nanoparticles as Perspective Additives for Friction and Wear Reduction. Correlation between Large-scale Friction Behavior and In situ TEM Compression Testing**
D.V. SHTANSKY[1], A.V. BONDAREV[1], A.M. KOVALSKII[1], K.L. FIRESTEIN[1,2], P.A. LOGINOV[1], D.A. SIDORENKO[1], N.V. SHVINDINA[1], I.V. SUKHORUKOVA[1], [1]National University of Science and Technology "MISIS", Moscow, Russia; [2]School of Chemistry, Physics and Mechanical Engineering, Queensland University of Technology (QUT), Brisbane, QLD, Australia

CC-1:L06 **Frictional Behavior and Properties of Fabric Reinforced C/SiC Brake Pads on a Steel Brake Disk**
S. FLAUDER, N. LANGHOF, W. KRENKEL, University of Bayreuth, Ceramic Materials Engineering, Bayreuth, Germany

CC-1:IL07 **Composite Solid Lubricants for Use in Extreme Environments**
M.T. DUGGER, Sandia National Laboratories, Albuquerque, New Mexico, USA

CC-1:IL08 **Diamond, cBN Reinforced Ceramic Materials: Potential Wear Resistant Components**
M. HERRMANN, B. MATTHEY, S. KUNZE, A.-K. WOLFRUM, Fraunhofer-IKTS, Dresden, Germany

CC-1:L09 **On Silicon-based Ceramics for Utilization in High Pressure Pumps for Gasoline Direct Injection and the Effects of Laser Surface Texturing**
P. SCHREIBER, J. SCHNEIDER, Karlsruhe Institute of Technology IAM-CMS, Karlsruhe, BW, Germany; P. ZIELONKA, K.G. SCHELL, E.C. BUCHARSKY, M.J. HOFFMANN, Karlsruhe Institute of Technology IAM-KWT, Karlsruhe, BW, Germany

CC-1:L10 **Noncontact Friction via Capillary Shear Interaction in Ambient Condition**
MANHEE LEE, B. KIM, J. KIM, W. JHE, Department of Physics, Chungbuk National University, Cheongju, Chungbuk, South Korea; Department of Physics and Astronomy, Seoul National University, Seoul, South Korea

CC-1:L11 **Mechanical Properties and Wear Behaviour of Boron Carbide/Graphene Platelet Ceramics**
R. SEDLAK[1], **A. KOVALCIKOVA**[1], J. BALKO[1], P. RUTKOWSKI[2], A. DUBIEL[2], E. MUDRA[1], V. GIRMAN[3,1], J. DUSZA[1], [1]Institute of Materials Research, Slovak Academy of Sciences, Division of Ceramic and Non-Metallic Systems, Kosice, Slovak Republic; [2]AGH University of Science and Technology in Krakow, Faculty of Materials Science and Ceramics, Department of Ceramics and Refractories, Krakow, Poland; [3]Pavol Jozef Safarik University in Kosice, Faculty of Science, Institute of Physics, Department of Condensed Matter Physics, Kosice, Slovak Republic

CC-1:IL12 **In Situ Generated Turbostratic 2D Graphite: A New Family of Self Lubricating Composites**
J.D. BIASOLI DE MELLO[1], C. BINDER[1], R BINDER[2], A.N. KLEIN[1], [1]Federal University of Santa Catarina, EMC, Florianópolis, SC, Brazil; [2]Whirphool / Embraco, Joinville, SC, Brazil; [3]Federal University of UberlAndia,UberlAndia, MG, Brazil

CC-1:IL13 **Tribochemistry and Environmental Effects in Friction of Amorphous Carbon Films**
F. MANGOLINI, Department of Mechanical Engineering, The University of Texas at Austin, Austin, TX, USA; K.D. KOSHIGAN, J. FONTAINE, Laboratoire de Tribologie et Dynamique des Systèmes, Ecole Centrale de Lyon, Ecully cedex, France; M.H. VAN BENTHEM, J.A. OHLHAUSEN, Sandia National Laboratories, Albuquerque, New Mexico, USA; J.B. McCLIMON, Department of Materials Science and Engineering, University of Pennsylvania, Philadelphia, PA, USA; J. HILBERT, R.W. CARPICK, Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania, Philadelphia, PA, USA

CC-1:L14 **Machining of Ceramic Matrix Composites**
R. GOLLER, A. ROESIGER, Augsburg University of Applied Sciences, Augsburg, Germany

CC-1:IL15 **Friction and Wear of Diamond: Atomic-scale Insights from Computer Simulations**
G. MORAS, Fraunhofer IWM, MicroTribology Centre, Freiburg, Germany

CC-1:L16 **Tribological Investigation on Friction and Wear of Al2O3-MgO Cutting-tool Ceramics on a Nickel-base Alloy**
P.A. RADI[1,2], **S.F. SANTOS**[3], J.V.C. SOUZA[3], L.VIEIRA[1,2], [1]Instituto Tecnológico de Aeronáutica (ITA), São José dos Campos, SP, Brazil; [2]Universidade do Vale do Paraíba (UniVap), Urbanova, São José dos Campos - SP, SP, Brazil; [3]Universidade Estadual Paulista (UNESP), Faculdade de Engenharia, Departamento de Materiais e Tecnologia, Guaratingueta, SP, Brazil

CC-1:L17 **Development of Si3N4 – SiC Composites for Tribological Applications**
P. ZIELONKA, P. SCHREIBER, E.C. BUCHARSKY, K.G. SCHELL, J. SCHNEIDER, M.J. HOFFMANN, Institute for Applied Materials, Karlsruhe Institute of Technology, Karlsruhe, Germany

CC-1:IL18 **Tribocorrosion in Biomaterials Science: An Overview**
L.A. ROCHA[1, 2], A.R. RIBEIRO[2, 3], [1]UNESP - Universidade Estadual Paulista, Fac. Ciências Bauru, São Paulo, Brazil; [2]IBTN/Br - Brazilian Branch of the Institute of Biomaterials, Tribocorrosion and Nanomedicine, Brazil; [3]Postgraduate Program on Translational Biomedicine, Grande Rio University, Duque de Caxias, Rio de Janeiro, Brazil

CC-1:L19 **Surface Properties of Sulfnitrided Layer formed on AISI4140 Steel by Plasma Nitriding**
HYUN JUN PARK[1, 2], SANG-SUP KIM[2], KYOUNG IL MOON[1], [1]Korea Institute of Industrial Technology, Heat Treatment R&D Group, Siheung-si, South Korea; [2]School of Materials Science and Engineering, Inha University, Incheon, South Korea

CC-1:L20 **Numerical Modelling of Nano / Micro Scratch Test Considering Scratch Tip Size Effect**
KWANGMIN LEE, K.P. MARIMUTHU, H. LEE, Sogang University, Seoul, South Korea

Session CC-2
Corrosion

CC-2:IL01 **Silicate Deposit Induced Degradation of Thermal and Environmental Barrier Coatings: Toward Integrated Models for Accelerated Coating Design**
D.L. POERSCHKE, University of Minnesota, Minneapolis, MN, USA

CC-2:IL02 **Corrosion and Oxidation of SiC Composites under High Temperature Water and Steam**
TETSUYA HINOKI, S. KONDO, K. KAWASAKI, F. SHINODA, Kyoto University, Gokasho, Uji, Kyoto, Japan

CC-2:IL03 **Electrochemical Corrosion and Electrochemical Machining of Ceramics**
M. SCHNEIDER, Fraunhofer IKTS Dresden, Dresden, Germany

CC-2:L04 **Controllable Synthesis of Al4SiC4 by Carbothermal Reduction Method and its Oxidation Behavior at High Temperature**
BIN LI[1], JUNHONG CHEN[1], XINMEI HOU[2], XINMING XING[1], KUO-CHIH CHOU[2], [1]School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China; [2]State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing, Beijing, China

CC-2:IL05 **Progress in Gas-solid Reaction Kinetics for Non-oxide Ceramic Materials at High Temperature**
ENHUI WANG, **XINMEI HOU**, KUOCHIH CHOU, State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing, Beijing, China; Collaborative Innovation Center of Steel Technology, University of Science and Technology Beijing, Beijing, China

CC-2:IL06 **Hot Gas Corrosion of Ceramic Materials**
W. KUNZ, H. KLEMM, A. MICHAELIS, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden, Germany

CC-2:L07 **Development of Advanced Environmental Barrier Coatings at NASA**
KANG N. LEE, B.J. HARDER, B.J. PULEO, NASA Glenn Research Center, Cleveland, OH, USA; G. COSTA, Vantage Partners, Cleveland, OH, USA

CC-2:IL08 **High Temperature Ceramic Materials for Space Applications**
M. BALAT-PICHELIN, PROMES-CNRS Laboratory, Font-Romeu Odeillo, France

CC-2:IL09 **Preparation and Oxidation Resistance of ZrB2-SiC Composite Powders by Molten-salt-mediated Magnesiothermic Reduction Synthesis**
HAIJUN ZHANG, The State Key Laboratory of Refractories and Metallurgy, Wuhan University of Science and Technology, Wuhan,China

CC-2:L10 **Elastomer Seal Corrosion Protection using DLC-Ag Film**
T. BAESSO[1], A.C. SENE[1], L.A. MANFROI, A.A. VIEIRA[1], P. A. RADI[1, 2], M. A. RAMIREZ[1],T.C.A.SANTOS[1], **L.VIEIRA**[1, 2], [1]University of Paraiba Valley-UNIVAP/ IP&D, Sao José dos Campos, SP-Brazil; [2]Aeronautics Institute of Technology, ITA / LPP, Sao José dos Campos, SP-Brazil

CC-2:IL11 **High Temperature Corrosion in Molten Salts & Molten Salts Technology: Past, Present and Future Through Coatings Technology**
F.J. PEREZ, Universidad Complutense de Madrid, Departamento de Ciencia de los Materiales e Ingeniería Metalúrgica, Madrid, Spain

CC-2:L12 **High-temperature Ageing of Si/SiC Ceramics**
L. CHARPENTIER, C. CALIOT, PROMES-CNRS, Font-Romeu Odeillo, France

CC-2:L13 **Tribocorrosion and Corrosion Studies on Stainless Steel Substrates Covered with DCL Films in Ethanol with Different Concentrations of Water**
P.A. RADI[1, 2], A.C. SENE[2], M.A. RAMIREZ[2], P. LEITE[2], L.VIEIRA[1, 2],[1]Instituto Tecnologico de Aeronautica (ITA), Sao José dos Campos, SP, Brazil; [2]Universidade do Vale do Paraíba (UniVap), Urbanova, Sao José dos Campos - SP, Brazil

CC-2:IL14 **Environmental Barrier Coating Stability in High Temperature Water**
R.A. GOLDEN, C.G. PARKER, M.J. RIDLEY, **E.J. OPILA**, Dept. of Materials Science and Engineering, University of Virginia, Charlottesville, Virginia, USA

CC-2:IL15 **Effects of Oxygen Potential Gradient and Electrical Characteristics on Mass Transfer in Environmental Barrier Coatings at High Temperature**
SATOSHI KITAOKA, T. MATSUDAIRA, M. TANAKA, Japan Fine Ceramics Center, Nagoya, Japan; T. SATO, O. SAKURADA, Gifu University, Gifu, Japan; Y. KAGAWA, Tokyo University of Technology, Hachioji, Japan

SYMPOSIUM CD
JOINING OF INORGANIC MATERIALS: FROM MACRO- TO NANO-LENGTH SCALES

Session CD-1
Nano-scale Interface of Dissimilar Materials

CD-1:IL01 **New Cu / Ceramics Bonding Technology for Highly Reliable Power Module Substrates**
YOSHIYUKI NAGATOMO, NOBUYUKI TERASAKI, YOSHIROU KUROMITSU, Mitsubishi Materials Corporatin, Central Rearch Institute, Saitama, Japan

CD-1:IL02 **Interface Engineering of Nanostructured Joining Materials**
L.P.H. JEURGENS, B. RHEINGANS, M. CHIODI, V. ARAULLO-PETERS, C. CANCELLIERI, J. JANCZAK-RUSCH, Empa, Swiss Federal Laboratories for Materials Science and Technology, Laboratory for Joining Technologies & Corrosion, Duebendorf, Switzerland

CD-1:IL03 **The Temperature and Time Dependence of Nanoscale Chemical Reactions at Brazed Alumina Joints**
P.M. MALLINSON, AWE Plc, Reading, UK, M. ALI, K.M. KNOWLES, University of Cambridge, UK

CD-1:IL04 **Defining Hetero-epitaxial Relationships of Films on Substrates**
D. CHATAIN, CINAM, Aix Marseille Univ, CNRS, Marseille, France; P. WYNBLATT, A.D. ROLLETT, MSE, Carnegie Mellon University, Pittsburgh PA, USA; U. DAHMEN, NCEM-Molecular Foundry, LNBL, Berkeley, CA, USA

CD-1:L05 **Wetting and Brazing of Vitreous Carbon by Reactive Ag-Cu-In-Ti Alloys**
M. TAZI, V. CHAUMAT Univ. Grenoble Alpes, CEA, LITEN, DTBH, LCA, Grenoble, France; **F. HODAJ**, Univ. Grenoble Alpes, CNRS, Grenoble INP, SIMAP, Grenoble, France

CD-1:L06 **Effect of Point Defects on Interfacial Bonding Between Noble Metal and TiO2(110) Surface**
KATSUYUKI MATSUNAGA, Department of Materials Physics, Nagoya University, Aichi, Japan; Nanostructures Research Laboratory, Japan Fine Ceramics Center, Aichi, Japan

CD-1:IL07 **Reactive Wetting and Filling of Nanotubes by Molten Metals to Design Advanced Nanocomposites**
P. NAUTIYAL, B. BOESL, **A. AGARWAL**, Plasma Forming Laboratory, Department of Mechanical and Materials Engineering, Florida International University, Miami, FL, USA

CD-1:IL08 **Atomic-scale Structural and Chemical Analysis of Heterointerfaces by Advanced Scanning Transmission Electron Microscopy**
A. KUMAMOTO, N. SHIBATA, **YUICHI IKUHARA**, Institute of Engineering Innovation, School of Engineering, The University of Tokyo, Tokyo, Japan

CD-1:L09 **Ionic Interdiffusion as Interaction Mechanism of Al and Si3N4**
E. ADABIFIROOZJAEI[1], F. EMADI[2], P. KOSHY[1], C.C. SORRELL[1], [1]School of Materials Science and Engineering, UNSW Australia, Sydney, NSW, Australia; [2]Department of Materials Science and Engineering, Sharif University of Technology, Tehran, Iran

Session CD-2
Micro-/Nano-joining

CD-2:IL01 **Electric Field Induced Equilibrium Grain Boundary Configurations in Ceramic Bicrystals**
L. HUGHES, **K. VAN BENTHEM**, University of California, Davis, CA, USA

CD-2:IL02 **Metal-to-ceramics Joining using Reduction Reaction of Silver Oxide**
AKIO HIROSE, K. ASAMA, K. MOTOYAMA, T. SANO, T. MATSUDA, Osaka University, Suita, Japan

CD-2:IL03 **Development of Nanostructured Joining Materials**
J. JANCZAK-RUSCH, M. CHIODI, V. ARAULLO-PETERS, C. CANCELLIERI, L.P.H. JEURGENS, Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland

CD-2:L04 **AE Evaluation of GaN Die-attach on DBC Substrate**
CHANYANG CHOE, S. J. NOH, C. CHEN, S. NAGAO, K. SUGANUMA, The Institute of Science and Industrial Research, Osaka University, Osaka, Japan

Session CD-3
Macro-joining

CD-3:IL01 **Wettability-induced Change in Crystallization Behavior of Supercooled Liquids Composed of Li2O-SiO2**
SOHEI SUKENAGA, M. TASHIRO, H. SHIBATA, IMRAM, Tohoku University, Sendai, Japan

CD-3:IL02 **Crack Paths in Layered, Graded Joints**
I. REIMANIS, Colorado School of Mines, Golden, CO, USA

CD-3:L03 **Homogeneous Diffusion Bonding of ZrCx: Empirical Evidence and Phase Field Modeling**
RUI PAN[1,2], S. KOVACEVIC[3], D.P. SEKULIC[1,2], S.DJ. MESAROVIC[3], [1]University of Kentucky, Lexington, KY, USA; [2]Harbin Institute of Technology, China; [3]Washington State University, USA

CD-3:IL04 **Joining of UHTC Composite using Powder-based Metallic Interlayer**
NORITAKA SAITO, KUNIHIKO NAKASHIMA, Kyushu University, Fukuoka, Japan

CD-3:IL05 **The Role of Wetting in Joining**
D.P. SEKULIC, College of Engineering, University of Kentucky, Lexington, KY, USA; School of Materials Science and Engineering, Harbin Institute of Technology, Harbin, China

CD-3:L06 **Mechanical Property of Dissimilar Metal Joints made by Friction Stirring**
MASAHIRO FUKUMOTO, TOSHIAKI YASUI, Toyohashi University of Technology, Toyohashi, Japan

Session CD-4
Application Engineering

CD-4:IL01 **Importance of Chemical Exchanges between Matrix and Reinforcement during Synthesis of Metal Matrix Composite**
O. DEZELLUS, J. ANDRIEUX, B. GARDIOLA, Laboratoire des Multimatériaux et Interfaces, Université Lyon 1, Villeurbanne, France

CD-4:IL03 **Torsion Shear Testing of Ceramic Joints for Components Design**
J. KUEBLER, G. BLUGAN, G. MATA-OSORO, Empa, Swiss Federal Laboratories for Materials Science and Technology Laboratory for High Performance Ceramics, Duebendorf, Switzerland

SYMPOSIUM CE
FRONTIERS IN NANOSTRUCTURED, NANOCOMPOSITE AND HYBRID FUNCTIONAL MATERIALS FOR ENERGY AND SUSTAINABILITY

Session CE-1
Innovative Processing of Nano- and Heterostructures and Films of Functional Materials

CE-1:IL01 **Low Cost Solution Processing of Nanowires for Flexible Devices**
YOUNG-JEI OH, B.-W. WANG, Opto/Electronic Materials & Devices Research Center, Korea Institute of Science and Technology (KIST), Seoul, South Korea; Department of Nanomaterials Science and Engineering, University of Science and Technology (UST), Dae-Jeon, South Korea

CE-1:IL02 **2D Oxide Nanosheets as Single-crystal Templates to Control Growth and Properties of Functional Oxides**
A. TEN ELSHOF, MESA+ Institute for Nanotechnology, University of Twente, AE Enschede, The Netherlands

CE-1:IL03 **TiO2-based Nanocrystals with Reduced Symmetry**
P.D. COZZOLI, Dipartimento di Matematica e Fisica "E. De Giorgi", Università del Salento, Lecce, Italy

CE-1:IL04 **Complex Composition and Structure Materials by Solution Chemistry**
G. WESTIN[1], S.N. KATEA[1], M. LEIDEBORG[1,3], K. LASHGARI[1,3], K. JANSSON[2], [1]Chemistry-Angstroem, Angstroem Laboratory, Uppsala University, Uppsala, Sweden; [2]Materials and Environmental Chemistry, Arrhenius Laboratory, Stockholm University, Stockholm, Sweden; [3]S-Solar, Finspang, Sweden

CE-1:IL05 **Low-temperature Synthesis of Metastable Materials with Anisotropic Morphology**
S. BARTH, TU Wien, Institute of Materials Chemistry, Vienna, Austria

CE-1:IL06 **Focused-ion-beam-enabled Electroless Metal Deposition on Silicon and Fabrication of Probes for Tip-enhanced Raman Spectroscopy**
MASAYUKI NISHI, Kyoto University, Kyoto, Japan

CE-1:IL07 **Flexibility of Core-shell Nanostructures for Clean Energy Work**
D. HC CHUA, National University of Singapore, Singapore

CE-1:IL08 **Recent Advances in the MOVPE Growth and Nano-Scale Characterization of III-V Nanowires for Photonics and Photovoltaics**
N. LOVERGINE, Università del Salento, Lecce, Italy; P. PRETE, IMM-CNR, Lecce, Italy

CE-1:L09 **Particle Sintering and Buildup of Solid-electrolyte Interfaces in APorous TiO2 Nanocrystal Electrodes**
K. RETTENMAIER, J. MIGUEL JIMÉNEZ, **T. BERGER**, Department of Chemistry and Physics of Materials, University of Salzburg, Salzburg, Austria

CE-1:IL10 **Low Temperature Growth of Graphene with In-situ TEM Observations**
MASAKI TANEMURA[1], M.I. ARABY[1], R. VISHWAKARMA[1], M.S. ROSMI[2], S. SHARMA[1], Y. WAKAMATSU[1], K. TAKAHASHI[1], G. KALITA[1], M. KITAZAWA[3], Y. YAAKOB[4], M.Z.M. YUSOP[5], [1]Dept. of Frontier Materials, Nagoya Inst. of Tech., Showa-ku, Nagoya, Japan; [2]Dept. of Chemistry, Faculty of Science and Mathematics, Universiti Pendidikan Sultan Idris, Tanjong Malim, Perak, Malaysia; [3]Olympus Co. Ltd., Nagano, Japan; [4]Dept. of Physics, Univ. Putra Malaysia, UPM Serdang, Selangor, Malaysia; [5]Dept. of Materials, Univ. Tech. Malaysia, Skudai, Johor, Malaysia

CE-1:L11 **Hybrid Down-converting Nano-structures for Solid State Lighting**
H. MENKARA, PhosphorTech, Kennesaw, GA, USA

CE-1:IL12 **Novel Routes to Non-oxide Metal-containing Nanoparticles (phosphides, carbides, oxysulfides)**
S. CARENCO, Sorbonne Universités, UPMC Univ Paris 06, CNRS, Collège de France, Lab. de Chimie de la Matière Condensée de Paris, Paris, France

Session CE-2
Functional Metal Oxide Nano- and Heterostructures

CE-2:IL01 **Designing Catalysts for Water-Splitting Reactions: Oxide-Oxide Bilayers as High Efficiency Photoelectrocatalysts**
S. MATHUR, Inorganic and Materials Chemistry University of Cologne, Cologne, Germany

CE-2:IL02 **ZnO Particles with Hierarchical Structures and Gas Sensing Application**
NORIKO SAITO, H. HANEDA, I. SAKAGUCHI; K. WATANABE, K. SHIMANOE, National Institute for Materials Science, Tsukuba, Japan; Kyushu University, Fukuoka, Japan

CE-2:IL03 **High Efficiency Air-stable Hybrid Solar Cells Fabricated with Graphene and Metal Oxide Based Nanocomposites**
YOON-BONG HAHN, School of Semiconductor and Chemical Engineering Chonbuk National University, South Korea

CE-2:IL04 **Chemical Synthesis of TiO2 and Complex Nanocrystals by Means of Colloidal Approaches**
M. EPIFANI, CNR-IMM, Lecce, Italy

CE-2:IL05 **Portable Static Hydroelectric Cell with Mesoporous SnO2 as the Backbone**
V. SOLANKI, S.B. KRUPANIDHI, **K.K. NANDA**, Materials Research Centre, Indian Institute of Science, Bangalore, India

CE-2:L06 **Functionalization of Oxide Banocrystals with Transition Metal Ions**
M. NIEDERMAIER, University of Salzburg, Salzburg, Austria; A. GHEISI, Friedrich-Alexander-University Erlangen, Bavaria, Erlangen, Germany; J.BERNARDI, Vienna University of Technology, Vienna, Austria; O. DIWALD, University of Salzburg, Salzburg, Austria

CE-2:IL07 **Strategies to Engineer Semiconducting Metal Oxides for Solar Energy Exploitation**
I. CONCINA, Lulea University of Technology, Lulea, Sweden

CE-2:IL08 **Back Interface Random Texturing for Enhanced Light Harvesting to Achieve High-efficiency Perovskite Solar Cells**
J. TOUDERT, M. KRAMARENKO, H. ZHANG, J. OSMOND, J. MARTORELL*, ICFO - Institut de Cienciès Fotoniques, The Barcelona Institute of Science and Technology, Castelldefels, Barcelona, Spain; *Departament de Física, Universitat Politècnica de Catalunya, Terrassa, Spain

CE-2:IL09 **Low-loss Rutile TiO2 Films for Nanophotonic Applications**
S. KUPRENAITE[1], S. GRIESSE-NASCIMENTO[2], S. MARGUERON[3], C. MILLON[1], D. RADDENZATI[1], E. MAZUR[2], **A. BARTASYTE**[1], [1]FEMTO-ST institute, Université Bourgogne Franche-Comté, ENSMM, Besançon, France; [2]School of Engineering and Applied Sciences, Harvard University, Cambridge, USA; [3]LMOPS Laboratory, Université de Lorraine et CentraleSupélec, Metz, France

CE-2:L10 **Enhancement of Oxygen Reduction Reaction (ORR) Catalytic Activity on the Modified Surface of La0.6Sr0.4Co0.2Fe0.8O3-δ by Palladium Nanoparticles**
MI YOUNG OH, HAN BIT KIM, TAE HO SHIN, Korea Institute of Ceramic Engineering and Technology, Jinju-si, Gyeongsangnam-do, South Korea

Session CE-3
Functional Materials and Sustainability

CE-3:IL01 **Photovoltaics for Use in Energy Conversions: From Capturing the Sun's Rays to Transmitting Power Optically**
K. HINZER, University of Ottawa, Ottawa, Ontario, Canada

CE-3:IL02 **Organic-inorganic Hybrid Aerogels and Xerogels with High Strength and Flexibility**
KAZUYOSHI KANAMORI, Department of Chemistry, Graduate School of Science, Kyoto University, Japan

CE-3:IL03 **Li-ion Conductor for Future Energy Storage**
LI LU, National University of Singapore National University of Singapore Suzhou Research Institute, Singapore

CE-3:IL04 **High Conversion Efficiency Materials for Thermoelectric Applications**
W. WONG-NG, C. BROWN, J. MARTIN, Q. HUANG, National Institute of Standards and Technology, Gaithersburg, MD, USA; Y. YAN, Wuhan University of Technology, Wuhan, China; Y.C. LAN, Morgan State University, Baltimore, MD, USA; Z.F. REN, University of Houston, Houston, TX, USA

CE-3:L05 **Nano-catalyst Infiltration Enhancement of Porous Solid Oxide Fuel Cell Electrodes Using Catechol Surfactants**
O. OZMEN, K. SABOLSKY, J.W. ZONDLO, **E.M. SABOLSKY**, West Virginia University, Morgantown, WV, USA; S. LEE, G. HACKETT, H. ABERNATHY, US Department of Energy, National Energy Technology Laboratory, Morgantown, WV, USA

CE-3:IL06 **Engineering Hematite and Silicon for Efficient Photoelectrochemical Water Splitting**
SHAOHUA SHEN, International Research Center for Renewable Energy, State Key Laboratory of Multiphase Flow in Power Engineering, Xi'an Jiaotong University, Xi'an, China

CE-3:IL07 **3D Nanoarchitectures for Energy Technologies and Biomedical Sensing - Enhancing Functionality through Correlative Microscopy**
S.H. CHRISTIANSEN, Helmholtz-Zentrum Berlin, Germany

CE-3:L08 **CO2/H2O Thermochemical Splitting on Porous SiOC Nanocomposites Decorated with 1D Catalytic Nanostructures**
AITANA TAMAYO[1], B. GARCIA[2]; E. CASADO[3], [1]Ceramics and Glass Institute, CSIC, Madrid, Spain; [2]Universidad Rey Juan Carlos, Madrid, Spain; [3]Universidad Politecnica Madrid, Madrid, Spain

CE-3:IL09 **Composite Nanostructures for High-efficiency Sunlight Harvesting**
A. VOMIERO, Department of Engineering Science and Mathematics, Lulea University of Technology, Lulea, Sweden

CE-3:IL10 **3D SEM Analysis of Nanostructured Materials prior to Morphological Characterization of Adipose Tissue**
R. SKAUDZIUS, E. GARSKAITE, **A. KAREIVA**, Institute of Chemistry, Vilnius University, Vilnius, Lithuania

CE-3:IL11 **Flux Crystal Growth Concept as New Approaches to Material Synthesis and Design: A Challenge for All-solid-state Lithium Ion Batteries**
KATSUYA TESHIMA, NOBUYUKI ZETTSU, Center for Energy and Environmental Science, Shinshu University, Nagano, Japan

CE-3:L12 **Ultra-long Vertically Aligned Lead Titanate Nanowire Arrays for Energy Harvesting in Extreme Environments**
A. NAFARI[1], C.C. BOWLAND[2], **H.A. SODANO**[1,3], [1]Department of Aerospace Engineering, University of Michigan, Ann Arbor, MI, USA; [2]Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA; [3]Department of Material Science Engineering, University of Michigan, Ann Arbor, MI, USA

SYMPOSIUM CF
HIGH AND ULTRA HIGH TEMPERATURE CERAMICS AND COMPOSITES FOR EXTREME ENVIRONMENTS

Session CF-1
Synthesis and Processing

CF-1:IL01 **Beyond YSZ For High Temperature Gas Turbines and Aerospace**
D.R. CLARKE, Harvard University Cambridge, MA, USA

CF-1:IL02 **Ultra-high Temperature Ceramic Matrix Composites (UHTCMCs)**
J. BINNER, V. RUBIO, M. PORTER, University of Birmingham, Edgbaston, Birmingham, UK

CF-1:IL03 **Synthesis, Processing and Characterization of Thermal Barrier Ceramics Based on Gd2Hf2O7 Pyrochlore Structure**
B. MATOVIC[1], J. MALETASKIC[1,2], J. LUKIC[1], M. PREKAJSKI DJORDJEVIC[1], M. FAJAR[2], K. YOSHIDA[2], T. YANO[2], [1]Centre of Excellence-CextremeLab, Institute for Nuclear Sciences Vinca, University of Belgrade, Belgrade, Serbia; [2]Lab.for Advanced Nuclear Energy, Institute of Innovative Research, Tokyo Institute of Technology, Ookayama, Meguro-ku, Tokyo, Japan

CF-1:IL04 **Fast Densification of UHT Ceramics and Composites by SPS**
D. SCITI, L. SILVESTRONI, L. ZOLI, ISTEC-CNR, Faenza, Italy

CF-1:L05 **Synthesis of Ultra-fine Hafnium Carbide Powders Combining the Methods of Liquid Precursor Conversion and Plasma Activated Sintering**
WEIMIN M. WANG, D.L. LU, H. WANG, F. ZHANG, J. WEI, Z.Y. FU, State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, Wuhan, China

CF-1:L06 **Development of High Temperature Na2SO4-NaCl-ceramic Composites for Solar Thermal Energy Storage**
YIFENG JIANG[1], **YANPING SUN**[2], SEAN LI[1], [1]University of New South Wales, Sydney, NSW, Australia; [2]CSIRO Energy, Newcastle, NSW, Australia

CF-1:IL07 **Sintering of Ultra-high Temperature, High Entropy Ceramics based on Multi-component Metal Carbides**
E.G. CASTLE, **M.J. REECE**, School of Engineering and Material Science, Queen Mary University of London, London, UK

CF-1:IL08 **Developing Cost-effective Manufacturing Methods and Processing Strategies for UHTCs**
C. TALLON, Department of Materials Science and Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA

CF-1:L09 **Target Materials for the Production of Radioisotopes at the SPES Facility**
S. CORRADETTI, A. ANDRIGHETTO, M. BALLAN, F. BORGNA, M. MANZOLARO, INFN - Laboratori Nazionali di Legnaro, Legnaro, Italy; S. CARTURAN, Università di Padova, Dipartimento di Fisica e Astronomia, Padova, Italy; L. BIASETTO, Università di Padova, Dipartimento di Tecnica e Gestione dei Sistemi Industriali, Vicenza, Italy; G. FRANCHIN, P. COLOMBO, Università di Padova, Dipartimento di Ingegneria Industriale, Padova, Italy

CF-1:L10 **Preparation and Characterization of the New Ultra-high Temperature Ceramics Aerogels and the Related Composites**
BAOSHENG XU, School of Aerospace Engineering, Tsinghua University, Beijing, China

CF-1:L11 **Additive Manufacturing of Hard Transparent Ceramics**
A.E.M. BROWAR, G. GUSS, J.D. KUNTZ, M.J. MATTHEWS, N. SHEN, R.M. PANAS, C.M. SPADACCINI, Lawrence Livermore National Laboratory, Livermore, CA, USA; J.D. ELLIS, University of Rochester, Rochester, NY, USA

CF-1:L12 **Preparation of Highly Macroporous Monolithic Transition Metal Borides/Carbides by Polymerization-induced Phase Separation**
FEI LI[1,2], XIAO HUANG[2], GUO-JUN ZHANG[1], [1]State Key Lab. for Modification of Chemical Fibers and Polymer Materials, Research Institute of Functional Materials, Donghua University, Shanghai, China; [2]Shanghai Institute of Ceramics, CAS, Shanghai, China

Session CF-2
Corrosion, Oxidation, and Testing

CF-2:IL01 **High Temperature Behaviour of Ti3SiC and TiAl2C in Air and Water Vapour Environment**
D.D. JAYASEELAN, Kingston University London, UK; KATSUMI YOSHIDA, Tokyo Institute of Technology, Japan; TOHRU TSUNOURA, Tokyo Tech, Japan; TAKUYA AOKI, Japan Aerospace Exploration Agency, Japan, TOSHIO OGASAWARA, Tokyo University of Agriculture and Technology, W.E. LEE, Imperial College London, UK

CF-2:IL02 **Development of Environmental Barrier Coatings for Non-oxide Ceramic Matrix Composites**
H. KLEMM, W. KUNZ, B. GRONDE, K. SCHÖNFELD, FhG IKTS Dresden, Dresden, Germany

CF-2:IL03 **Creep of HfB2-based UHTCs up to 2000 °C: A Critical Assessment on Structural Stability for Hypersonic Applications**
E. ZAPATA-SOLVAS[1], D. GÓMEZ-GARCIA[2], A. DOMÍNGUEZ-RODRÍGUEZ[2], W.E. LEE[1], [1]Centre for Nuclear Engineering (CNE), Dept. Materials, Imperial College London, UK; [2]Dept. Condensed Matter Physics, University of Seville, Seville, Spain

CF-2:IL04 **Relation between Microstructure and Protection Efficiency of a Rare Earth Silicate-based Environmental Barrier Coating**
F. REBILLAT[1], S. ARNAL[1], F. MAUVY[2], [1]Laboratoire des Composites Thermostructuraux, Pessac, France; [2]Institut de Chimie de la Matière Condensée de Bordeaux, Pessac, France

CF-2:IL05 **Cyclic Oxidation of Ti3Al-based Materials**
I. CVIJOVIC-ALAGIC, M.T. JOVANOVIC, D. ZAGORAC, B. MATOVIC, Institute of Nuclear Sciences "Vinča", University of Belgrade, Belgrade, Serbia; Z. CVIJOVIC, Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Serbia

CF-2:IL06 **Thermoablative Resistance of ZrB2-SiC-WC Ceramics at 2400 °C**
JI ZOU, V. RUBIO, J. BINNER, School of Metallurgy and Materials, University of Birmingham, Birmingham, UK

CF-2:IL07 **Corrosion Behavior of Slurry Coated RE Monosilicate EBCs on SiC/SiC**
N. AL NASIRI, Imperial College London, London, UK

CF-2:L08 **Ceramic Materials for High Efficiency Advanced Microturbines**
S. CONCARI, F. CERNUSCHI, RSE - Ricerca Sistema Energetico SpA, Milano, Italy

CF-2:IL09 **High-temperature Stability of (Ti,Nb)-Al-C MAX Phases Composites in Oxidizing and Hydrogen Atmosphere**
T. PRIKHNA, Institute for Superhard Materials of the National Academy of Sciences of Ukraine, Kiev, Ukraine

CF-2:IL10 **Laser Melting of Ultra-high Temperature Ceramics**
D. MANARA, K. BOBORIDIS, D. ROBBA, M. COLOGNA, R. KONINGS, European Commission, JRC Karlsruhe, Germany

CF-2:L11 **UHTC Thermal Sprayed Coatings behavior under Plasma Wind Tunnel Tests**
M. DE STEFANO FUMO, R. GARDI, CIRA, Capua, Italy; **M. TULUI**, F. ARCOBELLO VARLESE, S. LIONETTI, M. FORTUNATO, CSM, Rome, Italy

CF-2:L12 **Oxidation Behavior of HfB2-SiC and ZrB2-SiC Ultra-high Temperature Ceramics in Different Air Atmospheres**
C. PIRIOU, O. RAPAUD, S. FOUCAUD, SPCTS-CNRS UMR 7315, Limoges, France; L. CHARPENTIER, M. BALAT-PICHELIN, PROMES-CNRS UPR 8521, Font-Romeu Odeillo, France

CF-2:L13 **Oxidation Performance of BN-coated SiC Sylramic Fibers under Relevant Conditions for High-temperature Applications**
V. ANGELICI AVINCOLA, E.J. OPILA, University of Virginia, Charlottesville, VA, USA

CF-2:L14 **Anti-oxidation Performance of a Cf/UHTC Composite with a BN Interface**
P. MAKURUNJE, **I. SIGALAS**, School of Chemical and Metallurgical Engineering, University of the Witwatersrand, Johannesburg, South Africa and DST-NRF Centre of Excellence in Strong Materials, South Africa

Session CF-3
Mechanical and Thermal Properties

CF-3:IL01 **Modeling of Damage Evolution and Life Prediction in Fiber-reinforced Ceramic Matrix Composites under Tensile and Cyclic Loading at Elevated Temperatures in Oxidative Environments**
LONGBIAO LI, Nanjing University of Aeronautics and Astronautics, Nanjing, P.R. China

CF-3:IL02 **Deformation Mechanisms in Transitional Metal Carbides**
G.B. THOMPSON, C. SMITH, M. ROSS, XIAO-XIANG YU, N. DELEON, University of Alabama, Tuscaloosa, AL, USA; C.R. WEINBERGER, Colorado State University, Fort Collins, CO, USA

CF-3:L03 **Finite Element Constitutive Modeling of High-temperature Ceramics**
J.Y.R. RASHID, ANATECH-SI, San Diego, CA, USA

CF-3:IL04 **Making Porous UHTC's for Transpiration Cooling of Components**
L.J. VANDEPERRE, D. GLYMOND, L. LARRIMBE, W.E. LEE, Centre for Advanced Structural Ceramics & Department of Materials, Imperial College London, South Kensington Campus, London, UK

CF-3:IL05 **Defect Engineering in Development of Low Thermal Conductivity Materials**
WEI PAN, MENG ZHAO, XIAORUI REN, JUN YANG, CHUNLEI WAN, ZHIXUE QU, JING FENG, State Key Lab of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing, China

CF-3:L06 **On the Non-linear Young's Modulus Behavior of Carbon-bonded Materials at High Temperatures**
B. LUCHINI, J. GRABENHORST, J. FRUHSTORFER, C.G. ANEZIRIS, IKGB, TU-Bergakedemie Freiberg, Freiberg, Sachsen, Germany; V.C. PANDOLFELLI, GEMM, UFSCar, São Carlos, SP, Brazil

CF-3:L07 **Effect of Microstructural Features of SPSed Boron Carbide Ceramics on their Mechanical Properties**
L. ROUMIGUIER, A. JANKOWIAK, DEN-Service de Recherches Metallurgiques Appliquees, CEA, Universite Paris-Saclay, Gif-sur-Yvette, France; N. PRADEILLES, G. ANTOU, A. MAITRE, Science of Ceramic Processing and Surface Treatments Lab.- SPCTS, UMR CNRS 7315, Limoges, France

CF-3:L08 **Aluminum-dodecaboride- and Boroncarbide-based Lightweight Ceramics**
T.A. PRIKHNA[1], **P.P. BARVITSKIY**[1], V.B. MURATOV[2], S.N. DUB[1], V. DOMNICH[3], M.V. KARPETS[1], R. HABER [3], [1]Institute for Superhard Materials of the National Academy of Sciences of Ukraine, Kiev, Ukraine; [2]Institute for Problems in Material Science, NAS Ukraine, Kiev, Ukraine; [3]Department of Materials Science and Engineering, Rutgers, The State University of New Jersey, Piscataway, NJ, USA

CF-3:L09 **Thermo-mechanical Behaviour of Carbon-carbon Composite**
T. VOIRIN, P. REYNAUD, G. FANTOZZI, University of Lyon, INSA Lyon, MATEIS, Villeurbanne, France

CF-3:L10 **Spark Plasma Sintering and Mechanical Characterization of Titanium Nitride Ceramics**
B.M. MOSHTAGHIOUN, D. GOMEZ GARCIA, A. DOMINGUEZ RODRIGUEZ, Department of Condensed Matter Physics, University of Seville, Spain

CF-3:L11 **On the Thermal Properties of Celsian Ba/SrAl2Si2O8 Ceramics: Theoretical and Experimental Study**
LUCHAO SUN, J.Y. WANG, Shenyang National Laboratory for Materials Science; Institute of Metal Research, Chinese Academy of Sciences,Shenyang, China

CF-3:L12 **XFEM Investigations of Double Torsion Fracture Test**
K.P. MARIMUTHU, K. LEE, H. LEE, Sogang University, Seoul, South Korea

CF-3:IL13 **On the Plasticity and Grain Growth in Boron Carbide Ceramics**
D. GOMEZ-GARCIA, B.M. MOSHTAGHIOUN, A. DOMINGUEZ-RODRIGUEZ, Department of Condensed Matter Physics, University of Seville, Spain

CF-3:IL14 **Boride Ceramics with High Strength at Ultra-high Temperatures**
L. SILVESTRONI[1], D. SCITI[1], J. WATTS[2], W. FAHRENHOLTZ[2], G. HILMAS[2], [1]CNR-ISTEC, Faenza, Italy; [2]Dept. of Materials Science and Engineering, Missouri University of Science and Technology, Rolla, MO, USA

CF-3:L15 **Grahene-reinforced Alumina and Zirconia Composites: On their Potential Applications**
R. CANO-CRESPO, B.M. MOSHTAGHIOUN, D. GOMEZ-GARCIA, R. MORENO, A. DOMINGUEZ RODRIGUEZ, Department of Condensed Matter Physics, University of Seville, Spain Institute of Ceramics and Glass, CSIC, Spain

CF-3:L16 **The Opportunities and Challenges for Novel Materials for Future Power Generation Systems**
K. NAWAZ, E. LARA-CURZIO, JIANG HAO, Z. MILLS, ORNL, OAK RIDGE, TN, USA

CF-3:L17 **Alumina Whiskers-reinforced Alumina Composites. A New Option for High Temperature Applications?**
YOSHIHIRO TAMURA, B.M. MOSHTAGHIOUN, E. ZAPATA-SOLVAS, D. GOMEZ-GARCIA, **A. DOMINGUEZ-RODRIGUEZ**, C. CERECEDO-FERNANDEZ, V. VALCARCEL-JUAREZ, Department of Condensed Matter Physics, University of Seville, Spain

CF-3:L18 **A Theoretical Approach to Finite Strain Superplasticity in Carbon Nanofiber-reinforced and Graphene Oxide-reinforced Alumina and Zirconia Composites Sintered by Spark Plasma Sintering**
C. RETAMAL[1], R. CANO-CRESPO[2], R. VALLE-FUENTES[1], M. LAGOS[1], B.M. MOSHTAGHIOUN[2], D. GOMEZ-GARCIA[2, 3], R. MORENO[4], A. DOMINGUEZ-RODRIGUEZ[2], [1]Facultad de Ingeniería, Universidad de Talca, Campus Los Niches, Curicó, Chile; [2]Departamento de Física de la Materia Condensada, Universidad de Sevilla, Sevilla, Spain; [3]Instituto de Ciencia de Materiales de Sevilla, CSIC-US, Sevilla, Spain; [4]Instituto de Cerámica y Vidrio (ICV-CSIC), Madrid, Spain

Session CF-4
Characterization and Analysis

CF-4:IL01 **Nano-mechanical Testing of ZrB2 Ceramics**
J. DUSZA, Institute of Materials Research, SAS, Kosice, Slovakia

CF-4:L02 **Characterization of the Microstructure of 3C-SiC Coatings Grown by Chemical Vapor Infiltration (CVI)**
I. VITROLLES[1, 2], Y. LE PETITCORPS[2], H. PLAISANTIN[1, 2], J. ROGER[2], [1]Safran CERAMICS; [2]University of Bordeaux, LCTS, UMR 5801, Pessac, France

CF-4:L03 **Pitfalls of Determining the Elastic Properties of Stabilized Zirconia with Indentation Methods**
K. WERBACH[1], S. HUMMEL[1], C. EBNER[1], U. LOHBAUER[2], H. PETERLIK[1], [1]University of Vienna, Vienna, Austria; [2]University Erlangen-Nürnberg, Erlangen, Germany

CF-4:IL04 **Nanometer-scale Computer Simulation of Structure and Mechanical Properties of UHT Ceramics**
D. BRENNER, S. DAIGLE, M. LIM, M. DELOWER HOSSAIN, J.-P. MARIA, Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC, USA; C. TOHER, P. SARKER, S. CURTAROLO, Department of Mechanical Engineering and Materials Science, Duke University, Durham, NC, USA

CF-4:IL05 **Non-destructive Methods for Ceramic Materials - Characterization of SiC and SiC composite materials by HF Eddy Current Techniques**
S. HILLMANN, M. SCHULZE, **H. HEUER**, Fraunhofer IKTS Dresden, Germany

CF-4:IL06 **Prediction of Crack Deflection Behaviour in Ultra-high Temperature Ceramics**
M. ASLE ZAEEM, Dept. of Materials Science and Engineering, Missouri University of Science and Technology, Rolla, MO, USA

CF-4:L07 **The Characterization of Highly Porous Reaction-bonded Silicon Nitride Ceramics in the Presence of Oxide Additives**
R. NIKONAM M., M.D. PUGH, R.A.L. DREW, Concordia University, Department of Mechanical, Industrial and Aerospace Engineering, Montreal, Quebec, Canada

SYMPOSIUM CG
PROGRESS IN NANO-LAMINATED TERNARY CARBIDES, NITRIDES AND BORIDES (MAX/MAB) PHASES AND DERIVATIVES THEREOF (MXENES)

CG:KL **Expanding the Structural and Elemental Space of MAX Phases and MXenes**
J. ROSEN, Linköping University, Department of Physics, Chemistry and Biology (IFM), Linköping, Sweden

Session CG-1
Bulk and Thin Film Transport Properties of the MAX/MAB/MXenes

CG-1:IL01 **Transport Properties in MAX Single Crystals and MXenes**
T. OUISSE[1], D. PINEK[1], M.W. BARSOUM[2], T. ITO[3], [1]Université Grenoble-Alpes, CNRS, LMGP, Grenoble, France; [2]Department of Materials Science and Engineering, Drexel University, Philadelphia, PA, USA; [3]Synchrotron Radiation Research Center, Nagoya University, Nagoya, Japan

CG-1:IL02 **Mn2GaC Thin Films: Magnetic MAX Phase from Theory and Experiment**
A.S. INGASON[1, 2], M. DAHLQVIST[1], A. MOCKUTE[1], A. PETRUHINS[1], G.K. PALSSON[3, 4], J. ROSEN[1], [1]Thin Film Physics, Department of Physics, Chemistry and Biology (IFM), Linköping University, Linköping, Sweden; [2]Grein Research, Reykjavik, Iceland; [3]Dept. of Physics and Astronomy, Uppsala University, Uppsala, Sweden; [4]Institut Laue-Langevin, Grenoble, France

CG-1:IL03 **Ab-initio Calculations of the Thermoelectric Properties of MXenes**
U. SCHWINGENSCHLOGL, Physical Science and Engineering Division (PSE), King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia

Session CG-2
New MAX/MAB/MXenes

CG-2:IL01 **Prediction and Synthesis of New MAX Phases with in- and out of Plane Chemical Ordering**
M. DAHLQVIST, JUN LU, R. MESHKIAN, QUANZHENG TAO, L. HULTMAN, J. ROSEN, Department of Physics, Chemistry, and Biology (IFM), Linköping University, Linköping, Sweden

CG-2:IL02 **Novel Zr-based MAX Phase Solid Solutions**
J. VLEUGELS[1], T. LAPAUW[1, 2], B. TUNCA[1, 2], K. VAN LOO[1], K. LAMBRINOU[2], [1]KU Leuven, Department of Materials Engineering, Heverlee, Belgium; [2]SCK•CEN, Mol, Belgium

CG-2:IL03 **Magnetic MAX-phases: The Ultimate Material Class for Innovations in Spin-based Technologies ?**
M. FARLE, R. SALIKHOV, U. WIEDWALD, Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany

CG-2:IL04 **Novel MXene Materials and their Properties**
JIE ZHOU, MIAN LI, XIAOJING BAI, XIANHU ZHA, SHIYU DU, **QING HUANG**, Ningbo Institute of Industrial Technology, CAS, Ningbo, China

CG-2:L05 **Compatibility of Zr2AlC, (Zr,Ti)2AlC and (Zr,Ti)3AlC2 MAX Phases with Lead-Bismuth Eutectic (LBE)**
B. TUNCA[1, 2], T. LAPAUW[1, 2], K.G. PRADEEP[3], J. SCHNEIDER[3], R. DELVILLE[1], J. HADERMANN[4], J. VLEUGELS[2], K. LAMBRINOU[1], [1]Belgian Nuclear Research Centre, SCK•CEN, Mol, Belgium; [2]Dept. of Materials Engineering, KU Leuven, Heverlee, Belgium; [3]Materials Chemistry, RWTH Aachen University, Aachen, Germany; [4]Dept. of Physics, University of Antwerp, Antwerp, Belgium

CG-2:L06 **New MAX Phases and MXenes for Energy Relevant Applications**
M.H. TRAN, **C.S. BIRKEL**, Technische Universität Darmstadt, Darmstadt, Germany

Session CG-3
Mechanical Properties and Oxidation of MAX/MAB/MXenes

CG-3:IL01 **Ripplocations: A Universal Mechanism in the Deformation of Layered Solids**
M.W. BARSOUM, Drexel University, Philadelphia, PA, USA

CG-3:IL02 **Self-healing Properties of MAX-phases: Thermodynamic Predictions and Reality**
S. VAN DER ZWAAG, W.G. SLOOF, Delft University of Technology, Delft, The Netherlands

CG-3:IL03 **Oxidation, Thermal Stability, and Mechanical Deformation of the Alumina-forming Nanolaminated Boride: MoAlB**
S. KOTA, A. LY, O. ELKASSABANY, A. HUON, S.J. MAY, M.W. BARSOUM, Department of Materials Science & Engineering, Drexel University, Philadelphia, PA, USA; E. ZAPATA-SOLVAS, W.E. LEE, Centre for Nuclear Engineering & Department of Materials, Imperial College London, UK; YEXIAO CHEN, D. LOPEZ, M. RADOVIC, Department of Materials Science & Engineering, Texas A&M University, College Station, TX, USA; JUN LU, L. HULTMAN, Linköping University, Department of Physics (IFM), Linköping, Sweden; B. GARDIOLA, O. DEZELLUS, Université Claude Bernard LYON1, Laboratoire des Multimatériaux et Interfaces, UMR CNRS 5615, Villeurbanne, France

CG-3:IL04 **MAX Phase High-temperature Plasticity: Nanoindentation and Transmission Electron Microscopy Analysis of Dislocations Elementary Mechanisms**
W. SYLVAIN, **A. JOULAIN**, C. TROMAS, L. THILLY, Pprime Institute, CNRS, University of Poitiers, ISAE-ENSMA, France; S. SCHROEDERS, C. ZEHNDER, S. KORTE, C. IMM- RWTH Aachen University, Germany; G. RENOU, SIMAP, Grenoble, France

CG-3:IL05 **Ablation and Thermal Shock Behaviours of MAX Phases**
SHIBO LI, Center of Materials Science and Engineering, School of Mechanical and Electronic Control Engineering, Beijing Jiaotong University, Beijing, China

CG-3:IL06 **Mechanical Behavior and Strengthening of Alumina forming MAX Phases**
M. RADOVIC[1], R. BENITEZ[2], HULI GAO[2], YEXAIO CHEN[1], WEN HAO KAN[3], G. PROUST[3], P. NAIK PARRIKAR[4], ARUN SHUKLA[4], [1]Department of Material Science and Engineering, Texas A&M University, College Station, TX, USA; [2]Department of Mechanical Engineering, Texas A&M University, College Station, TX, USA; [3]School of Civil Engineering, The University of Sydney, NSW, Australia; [4]Department of Mechanical, Industrial and Systems Engineering, University of Rhode Island, Kingston, RI, USA

CG-3:IL07 **Structure and Local Composition Evolution of Cr2AlC with and without Si Additions during Oxidation**
J.M. SCHNEIDER, Materials Chemistry, RWTH Aachen University, Aachen, Germany

CG-3:L08 **Relationship between Microstructure and Oxidation Resistance of Ti3AlC2 MAX Phase**
V. GAUTHIER-BRUNET[1], E. DROUELLE[1, 2], J. CORMIER[1], P. VILLECHAISE[1], S. DUBOIS[1], P. SALLOT[2], [1]Institut Pprime, CNRS, Université de Poitiers, ENSMA, UPR CNRS 3346, Futuroscope Chasseneuil, France; [2]Safran CRT, Magny-les-Hameaux Cedex, France

CG-3:L09 **Corrosion Behaviour of MAX Phases in Molten Solar Salt and Liquid Heavy Metal**
K. VAN LOO[1], T. LAPAUW[1, 2], P. SZAKÁLOS[3], K. LAMBRINOU[2], J. VLEUGELS[1], [1]KU Leuven, Department of Materials Engineering, Heverlee, Belgium; [2]SCK•CEN, Mol, Belgium; [3]KTH, Surface and Corrosion Science, Stockholm, Sweden

CG-3:L10 **Experimental and Theoretical Investigations on MAX/Intermetallic Two-phase Materials**
G. HUG[1], K. PIVEN[1], A. JANKOWIAK[2], C. LU[1, 3], JIE ZHANG[3], [1]LEM ONERA-CNRS, Chatillon, France; [2]DMAS ONERA, Châtillon France; [3]Harbin Institute of Technology, Harbin, China

CG-3:L11 **Environmental Resistance of Cr2AlC MAX Phase under Realistic Conditions**
J. GONZALEZ-JULIAN, T. GO, D. MACK, O. GUILLON, R. VASSEN, Forschungszentrum Jülich, Institute of Energy and Climate Research (IEK-1), Juelich, Germany

CG-3:L12 **Tensile Creep Properties of Ti3AlC2**
S. DUBOIS[1], E. DROUELLE[1, 2], J. CORMIER[1], V. GAUTHIER-BRUNET[1], P. VILLECHAISE[1], P. SALLOT[2], [1]Institut Pprime, CNRS - Université de Poitiers - ENSMA, UPR CNRS 3346, Futuroscope Chasseneuil, France; [2]Safran CRT, Magny-les-Hameaux Cedex, France

Session CG-4
MAX/MAB and MXene Composites and their Properties

CG-4:IL01 **On the Processing and Characterization of MRM (MAX and MAB Reinforced Metals) Composites**
S. GUPTA, M. FUKA, F. ALANAZI, S. GHOSH, M. DEY, University of North Dakota, Grand Forks, ND, USA

CG-4:L02 **Influence of Secondary Phases on Mechanical Properties of MAX Phases**
K. KOZAK, G. ANTOU, T. CHOTARD, Université de Limoges, SPCTS, UMR 7315, Limoges, France; J. LIS, L. CHLUBNY, AGH UST, Cracow, Poland

CG-4:L03 **Magnetic Ordering Investigation in Mn2AlB2 using Neutron Diffraction**
D. POTASHNIKOV, IAEC, Tel-Aviv, Israel; O. RIVIN, A. PESACH, E.N. CASPI, NRCN, Beer-Sheva, Israel; A. HOSER, HZB, Berlin, Germany; S. KOTA, M.W. BARSOUM, Drexel University, Philadelphia, PA, USA

Session CG-5
Electronic Properties, *ab initio* Calculations and Structural Characterization

CG-5:IL01 **MXene Surface Functionalization Characterized on the Nanometer Scale using EELS in the TEM**
V. MAUCHAMP, D. MAGNE, C. GARNERO, T. BILYK, P. CHARTIER, T. CABIOC'H, J. PACAUD; Institut Pprime - CNRS, Poitiers University, ISAE/ENSMA S. CELERIER, IC2MP, Poitiers University, France

CG-5:IL02 **Understanding the Magnetic Properties of Nano-laminated Ternary Carbides, Nitrides and Borides: the Role of Neutron Scattering**
E.N. CASPI, O. RIVIN, A. PESACH, NRCN, Beer-Sheva, Israel; H. SHAKED, BGU University, Beer-Sheva, Israel; A. HOSER, HZB, Berlin, Germany; R. GREGORII, MLZ, Garching, Germany; Q. TAO, J. ROSEN, Linköping University, Linköping, Sweden; S. KOTA, M.W. BARSOUM, Drexel University, Philadelphia, PA, USA

CG-5:IL03 **Beyond High-Throughput: Robust and Optimal Ab-Initio Exploration of MAX Phase Spaces**
R. ARROYAVE, A. TALAPATRA, SHAHIN BOLUKI, XIAONING QIAN, M. RADOVIC, Texas A&M University, College Station, TX, USA

CG-5:IL04 **Band Structure and Fermi Surfaces of MAX Phases investigated by Angle Resolved Photoemission Spectroscopy (ARPES)**
TAKAHIRO ITO, Nagoya University Synchrotron Radiation Research Center (NUSR), Nagoya University, Nagoya, Japan; T. FUJITA, Graduate School of Engineering, Nagoya University, Nagoya, Japan; D. PINEK, T. OUISSE, Université Grenoble-Alpes, CNRS, LMGP, Grenoble, France; M. NAKATAKE, Aichi Synchrotron Radiation Center, Seto, Japan; S. IDETA, K. TANAKA, Institute for Molecular Science, Okazaki, Japan

CG-5:IL05 **Atomically Resolved Electron Microscopy of MXenes**
P.O.A. PERSSON, Linköping University, Linköping, Sweden

CG-5:IL06 **Electronic Properties of MXenes from ab initio Calculations Perspective**
M. KHAZAEI, RIKEN Advanced Institute for Computational Science, Kobe, Japan

CG-5:L07 **Theoretical Study on the Intrinsic Point Defect Sinks in MAX Phases under Irradiation**
JIEMIN WANG, J.Y. WANG, High-performance Ceramic Division, Shenyang National Laboratory for Materials Science, Institute of Metal Research, CAS, Shenyang, China

CG-5:L08 **Vacancy-ordered Mo1.33C MXene from first principles and x-ray photoelectron spectroscopy**
H. LIND, J. HALIM, S.I. SIMAK, J. ROSEN, Department of Physics, Chemistry, and Biology, Linköping University, Linköping, Sweden

Session CG-6
Synthesis and Fabrication of MAX/MAB/MXenes

CG-6:IL01 **2D Atomic Sandwiches of Ordered Double-transition Metal Carbides (MXenes)**
B. ANASORI, Y. GOGOTSI, A.J. Drexel Nanomaterials Institute and Department of Materials Science & Engineering, Drexel University, Philadelphia, PA, USA

CG-6:IL02 **MAX Phase Thin Film Synthesis by Annealing Techniques**
T. CABIOCH, D. MAGNE, V. MAUCHAMP, J. NICOLAI, M.F. BEAUFORT, Département de Physique et Mécanique des Matériaux, Institut P', University of Poitiers-CNRS-ENSMA, Chasseneuil-Futuroscope, France

CG-6:IL03 **MXene Electrochemical Etching and Morphology Alteration**
WANMEI SUN, SMIT SHAH, TOUSEEF HABIB, M. RADOVIC, **M.J. GREEN**, A. McFERRIN, Dept. of Chemical Engineering, Dept. of Materials Science & Engineering, Texas A&M University, College Station, TX, USA

CG-6:L04 **Self-propagating High-temperature Synthesis and Properties of the MAX Phases in Ti-Al-C System**
A. PAZNIAK, D. KUZNETSOV, NUST "MISiS", Moscow, Russia, P. BAZHIN, A. STOLIN, ISMAN, Chernogolovka, Russia

CG-6:L05 **Synthesis of MAX Phases by Molten Salt Shielded Synthesis Process in Air**
A. DASH, O. GUILLON, R. VASSEN, J. GONZALEZ-JULIAN, IEK-1, Forschungszentrum Jülich GmbH, Jülich, Germany

CG-6:L06 **Synthesis and Thermal Stability of High Pure V2C MXene**
BINGXIN WANG, **AIGUO ZHOU**, QIANKU HU, LIBO WANG, HONGTIAN HE, School of Materials Science and Engineering, Henan Polytechnic University, Jiaozuo, Henan, China

Session CG-7
Functional Properties of MAX/MAB/MXenes

CG-7:L01 **Magnetic Properties of the Nanolaminated Mn2GaC MAX Phase**
Iu.P. NOVOSELOVA[1], R. SALIKHOV[1], U. WIEDWALD[1], M. SPASOVA[1], J. ROSEN[2], M. FARLE[1, 3], [1]Faculty of Physics and Center for Nanointegration Duisburg-Essen (CENIDE), University Duisburg-Essen, Duisburg, Germany; [2]Thin Film Physics Division, Department of Physics, Linköping University, Linköping, Sweden; [3]Center for Functionalized Magnetic Materials (FunMagMa), IKBFU, Kaliningrad, Russia

CG-7:L02 **Large Uniaxial Magnetostriction with Sign Inversion at the First Order Phase Transition in Mn2GaC Films**
R. SALIKHOV, Iu.P. NOVOSELOVA, U. WIEDWALD, M. FARLE, Faculty of Physics, University of Duisburg-Essen, Duisburg, Germany; A. PETRUHINS, A.S. INGASON, J. ROSEN, Linköping University, Linköping, Sweden; T. HASE, University of Warwick, Coventry, UK

Session CG-8
Energy Storage

CG-8:IL01 **High-capacitance Mechanism for Ti3C2Tx MXene by in Situ Electrochemical Raman Spectroscopy Investigation**
XIAOHUI WANG, Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences, Shenyang, China

CG-8:IL02 **MXenes as Hosting Materials for Ions and Molecules**
M. NAGUIB, Department of Physics and Engineering Physics, Tulane University, New Orleans, LA, USA

CG-8:IL03 **Microwave-assisted Synthesis of MXene-based Hybrids for Energy Storage in Supercapacitor and LIB**
W. ZHENG, **ZHENG MING SUN**, Jiangsu Key Laboratory of Advanced Metallic Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China

CG-8:L04 **A Fast Route to Synthesize CNTs@Ti3C2 Hybrid Structures**
WEI ZHENG[1], P.G. ZHANG[1], W.B. TIAN[1], J. CHEN[1], Y.M. ZHANG[2], Z.M. SUN[1], [1]Jiangsu Key Laboratory of Advanced Metallic Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China; [2]Jiangsu Key Laboratory of Construction Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China

CG-8:L05 **Core-shell SnO2@C Decorated 3D d-Ti3C2 Xerogel Framework as the Anode for High-performance Lithium-ion Battery**
HENG ZHANG, P.G. ZHANG, W. ZHENG, J. CHEN, W.B. TIAN, Z.M. SUN, Jiangsu Key Laboratory of Advanced Metallic Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China; Y.M. ZHANG, Jiangsu Key Laboratory of Construction Materials, Southeast University, Nanjing, P.R. China

CG-8:L06 **Binder-free Ti3C2 MXene-carbon Nanotube Supercapacitor Electrode Produced by Electrophoretic Deposition**
LI YANG[1], P. ZHANG[1], W. ZHENG[1], W.B. TIAN[1], J. CHEN[1], Y.M. ZHANG[2], Z.M. SUN[1], [1]Jiangsu Key Laboratory of Advanced Metallic Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China; [2]Jiangsu Key Laboratory of Construction Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China

Session CG-9
Applications of the MAX/MAB and MXene Phases

CG-9:IL01 **Catalytic Activity of MXenes for Hydrogenation and Hydrogenolysis Reactions**
A. VILLA[1], M. NAGUIB[2], [1]Department of Chemistry, University of Milan, Milan Italy; [2]Department of Physics and Engineering Physics, Tulane University, New Orleans, LA, USA

CG-9:IL02 **TIG-Brazing of MAX Phases**
M. HADJI, University of Blida 1, Blida, Algeria

CG-9:L03 **Applications 2D Carbides, Nitrides and Carbonitrides (MXenes)**
Y. GOGOTSI, A.J. Drexel Nanomaterials Institute, and Department of Materials Science & Engineering, Drexel University, Philadelphia, PA, USA

CG-9:L04 **Irradiation Tolerance of Zr2AlC MAX Phase**
H. QARRA, K. KNOWLES, University of Cambridge, Cambridge, UK

CG-9:IL05 **On the Feasibility of Nano-laminated Carbides as ATF Coatings in LWRs**
JIE ZHANG, YIMING LEI, LINA CHEN, JINGYANG WANG, Shenyang National Laboratory for Materials Science, Institute of Metal Research, CAS, Shenyang, China

CG-9:IL06 **MAX Phase Materials for Gen-IV Lead-fast Nuclear Reactors (LFRs)**
K. LAMBRINOU[1], T. LAPAUW[1, 2], B. TUNCA[1, 2], J. VLEUGELS[2], [1]Belgian Nuclear Research Centre, SCK•CEN, Mol, Belgium; [2]Department of Materials Engineering, KU Leuven, Heverlee, Belgium

CG-9:L07 **Effect of Temperature and Atmosphere on Sn Whisker Growth on Ti2SnC**
YUSHUANG LIU[1], P. ZHANG[1], W.B. TIAN[1], Y.M. ZHANG[2], Z.M. SUN[1], [1]Jiangsu Key Laboratory of Advanced Metallic Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China; [2]Jiangsu Key Laboratory of Construction Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China

SYMPOSIUM CH
CERAMIC THIN FILMS AND COATINGS FOR PROTECTIVE, TRIBOLOGICAL AND MULTIFUNCTIONAL APPLICATIONS

CH:KL **Funtional Surfaces and Coatings - New ceramic technologies for the benefit of industries and mankind -**
R. GADOW, University of Stuttgart, Stuttgart, Germany

Session CH-1
Advances in Deposition, Surface Modification and Characterisation Techniques

CH-1:IL01 **Observing Unobservable: Active Diagnostics of Electrolytic Plasma Processes for In-situ Identification of Surface Properties**
A. YEROKHIN, University of Manchester, Manchester, UK

CH-1:IL02 **Cold Spray: From Coating to Additive Manufacturing**
B. JODOIN, D. McDONALD, P. DUPUIS, Y. CORMIER, University of Ottawa, Ottawa, ON, Canada

CH-1:IL03 **Deposition Mechanisms in Hybrid Molecular Beam Epitaxy of Complex Ceramic Oxides**
R.P. HARKINS, TIANQI WANG, A. PRAKASH, C.J. CRAMER, B. JALAN, **W.L. GLADFELTER**, Departments of Chemistry and Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, USA

CH-1:IL04 **Plasma Enhanced Magnetron Sputter (PEMS) Deposition of Ceramic Coatings for Extreme Environments**
RONGHUA WEI, Southwest Research Institute, San Antonio, TX, USA

CH-1:IL05 **High Velocity Flame Spraying (HVSFS) of Nano-structured Coatings and Related Industrial Applications**
R. GADOW, **A. KILLINGER**, University of Stuttgart, Institute for Manufacturing Technologies of Ceramic Components and Composites (IFKB), Stuttgart, Germany

CH-1:IL06 **Non Reactive High Impulse Magnetron Sputtering of Oxide Ceramics**
R. GADOW, A. KILLINGER, Institute for Manufacturing Technologies of Ceramic Components and Composites, University of Stuttgart, Stuttgart, Germany; **B. GAEDIKE**, Matthias Luik, Hartmetall-Werkzeugfabrik Paul Horn GmbH, Tuebingen, Germany

CH-1:L07 **Aerosol Deposition: A Top-down Approach to Nano-crystalline, Functional Ceramic Films and Tribological Coatings**
P.A. FUIERER, Materials & Metallurgical Engineering Dept., New Mexico Tech, Socorro, NM, USA

CH-1:L08 **YBCO Seed Layer grown by Polymer Assisted Deposition for the Further Growth of MOD Propionate-based YBCO Film**
M. NASUI, R.B. MOS, T. PETRISOR Jr., M.S. GABOR, A. MESAROS, L. CIONTEA, T. PETRISOR, Centre for Superconductivity, Spintronics and Surface Science, Technical University of Cluj-Napoca, Cluj-Napoca, Romania

CH-1:L09 **Effect of Annealing Temperature on the Structural, Morphological, and Mechanical Properties of Polycrystalline Zirconium Oxynitride Composite Films Deposited by Plasma Focus Device**
I.A. KHAN[1], M. KASHIF[1], A. FARID[1], R.S. RAWAT[2], R. AHMAD[3], [1]Department of Physics, Government College University, Faisalabad, Pakistan; [2]National Institute of Education, Nanyang Technological University, Singapore; [3]Department of Physics, GC University, Lahore, Pakistan

CH-1:L10 **Silicon Oxycarbide Coatings by Low Pressure Chemical Vapour Deposition**
F. DEMEYER, S. JACQUES, Y. LE PETITCORPS, University of Bordeaux, CNRS, Safran, CEA, Laboratoire des Composites Thermostructuraux (LCTS), UMR 5801, Pessac, France; A. DELEHOUZE, Safran Ceramics, Safran Group, Le Haillan, France

Session CH-2
High Temperature Protective Coatings in Oxidising and Harsh Environments

CH-2:IL01 **Environmental Barrier Coatings for All-oxide Ceramic Matrix Composite Combustor Liners**
P. MECHNICH, German Aerospace Center (DLR) Institute of Materials Research, Koeln, Germany

CH-2:L02 **Materials for Very High Temperature Solar Receivers**
J. COLAS, L. CHARPENTIER, M. BALAT PICHELIN, PROMES-CNRS, Font-Romeu Odeillo, France ; M. PONS, F. MERCIER, D. CHEN, SIMaP, St-Martin-d'Hères cedex, France ; D. PIQUE, SIL'TRONIX ST, Archamps, France

CH-2:L03 **Superior High-temperature Behavior of Amorphous Coatings from Quinary Hf-B-Si-C-N System**
P. ZEMAN, S. ZUZJAKOVA, R. CERSTVY, J. VLCEK, Department of Physics and NTIS - European Centre of Excellence, University of West Bohemia, Plzen, Czech Republic

CH-2:L04 **Structure Design and Fabrication of Environmental Barrier Coatings for Crack Resistance**
JIA LIU, Xi'an University of Science and Technology, Xi'an, P.R. China

Session CH-3
Thermal Barrier Coatings

CH-3:IL01 **Present and Future of Thermal Barrier Coatings**
R. VASSEN[1], D.E. MACK[1], O. GUILLON[1, 2], [1]Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research, Materials Synthesis and Processing (IEK-1), Jülich, Germany; [2]Jülich Aachen Research Alliance: JARA-Energy

CH-3:IL02 **Microstructural Evolution and Thermal Barrier Performance of Plasma-sprayed YSZ Coatings**
KYEONG-HO BAIK, HEE-JIN PARK, SANG-WOON KANG, Department of Materials Science and Engineering, Chungnam National University, Yuseong, Daejeon, South Korea

CH-3:IL03 **Thermal Spray as an Additive/Layered Manufacturing Technology for Energy Related Applications**
S. SAMPATH, Center for Thermal Spray Research, Stony Brook University, Stony Brook, NY, USA

CH-3:L04 **Degradation of Zirconates and Novel Air-plasma-sprayed LaYbZr2O7 Thermal Barrier Coatings by Environmental Molten Salt and CMAS (CaO–MgO–Al2O3–SiO2)**
MIN WANG, XINCHUN LAI; JUN YANG, SICONG GUO, ZIYUAN WANG, WEI PAN, Institute of Materials, China Academy of Engineering Physics; State Key Laboratory of New Ceramics and Fine Processing, Tsinghua University, China

CH-3:L05 **Corrosive and Mechanical Properties of ZrO2 Thermal Barrier Coatings by Thermal Exposure**
BYUNG-KOOG JANG[1], KOUICHI YASUDA[2], SEONGWON KIM[3], YOON-SUK OH[3], HYUNG-TAE KIM[3], [1]Research Center for Structural Materials, National Institute for Materials Science, Tsukuba, Japan; [2]Department of Materials Science and Engineering, Tokyo Institute of Technology,Tokyo, Japan; [3]Engineering Ceramic Center, Korea Institute of Ceramic Engineering and Technology, Icheon, South Korea

Session CH-4
Tribological Thin Films and Coatings

CH-4:IL01 **Self-Adaptive Mechanisms in Tribological Coatings Designed for Harsh Environment Applications**
A.A. VOEVODIN, S. AOUADI, University of North Texas, Denton, TX, USA; C. MURATORE, University of Dayton, Dayton, OH, USA

CH-4:IL02 **Self Adaption In Tribological Coatings**
A. CAVALEIRO, F. FERNANDES, SEG-CEMMPRE, University of Coimbra and LED&Mat, Instituto Pedro Nunes, Coimbra, Portugal; T. POLCAR, FEL-CVUT, Czech Technical University, Prague, Czech Republic and nCATS, University of Southampton, UK

CH-4:L03 **Tribological Properties of the Hydrogenated W-C/ a-C:H Coatings in Different Environments**
F. LOFAJ[1], D. MEDVED[1], M. KABATOVA[1], J. NOHAVA[2], J. DOBROVODSKY[3], P. NOGA[3], [1]Institute of Materials Research of SAS, Kosice, Slovakia; [2]Anton Paar, Peseux, Switzerland; [3]Advanced Technologies Research Institute, Faculty of Materials Science and Technology in Trnava, Slovak University of Technology in Bratislava, Trnava, Slovakia

CH-4:L04 **Chemical Vapour Deposition of ZrN using insitu Produced ZrCl4 as a Precursor**
E. RAUCHENWALD, R. HAUBNER, Institute of Chemical Technologies and Analytics, TU Wien, Vienna, Austria; M. LESSIAK, R. WEISSENBACHER, Boehlerit GmbH & Co. KG, Kapfenberg, Austria

CH-4:IL05 **Wear Resistant Thermal Spray Coatings**
G. BOLELLI, **L. LUSVARGHI**, T. MANFREDINI, P. PUDDU, V. TESTA, Università degli Studi di Modena e Reggio Emilia, Modena, Italy

CH-4:IL06 **Application and Limitations of Residual Stress Analysis in Wear Resistant Materials**
M. WENZELBURGER, Federal-Mogul Powertrain, Federal-Mogul Friedberg GmbH, Friedberg, Germany

CH-4:L07 **High Performance Ti(C,N)-Ni3Al Cermets and Coatings**
K. PLUCKNETT, Z. MEMARRASHIDI, M. GAIER, W.A. SPARLING, T.L. STEWART, Dalhousie University, Halifax, NS, Canada

CH-4:L08 **Tribological Characterization of Mo-Cu-N, Mo-Cu-X(X=Cr, Ni, Si)-N Coatings Using Alloy Targets**
KYOUNG IL MOON, HAN-CHAN LEE, Korea Institute of Industrial Technology, Gyeonggi-do, South South Korea

Session CH-5
Smart and Multifunctional Thin Films and Coatings

CH-5:IL01 **Amorphous Alumina Tunable Barrier Films: An Integrated Process-local Coordination-properties Investigation**
C. VAHLAS, D. SAMELOR, CIRIMAT, Toulouse, France; V. SAROU-KANIAN, P. FLORIAN, CEMHTI, Orléans, France; B. CAUSSAT, H. VERGNES, LGC, Toulouse, France

CH-5:IL02 **Iron Boride Coatings for Wear and Corrosion Resistance Applications**
E. MEDVEDOVSKI, Endurance Technologies, Inc., Calgary, Canada

CH-5:L03 **How to Improve the Oxidation Resistance of Ultra-high Temperature Ta-C Coatings: An ab initio Guided Approach**
H. RIEDL, T. GLECHNER, N. KOUTNA, T. WOJCIK, P.H. MAYRHOFER, Institute of Materials Science and Technology, TU Wien, Wien, Austria; S. KOLOZSVARI, Plansee Composite Materials GmbH, Lechbruck am See, Germany; D. HOLEC, Department Physical Metallurgy and Materials Testing, Montanuniversität Leoben, Leoben, Austria; P. FELFER, Department of Materials Science, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

CH-5:L04 **HiPIMS Deposition of Ta-O-N Coatings for Water Splitting Application**
J. CAPEK, S. BATKOVA, J. HOUSKA, R. CERSTVY, S. HAVIAR, Department of Physics and NTIS - European Centre of Excellence, University of West Bohemia, Plzen, Czech Republic; T. DUCHON, Department of Surface and Plasma Science, Charles University, Praha, Czech Republic

CH-5:L05 **Towards Understanding the Growth of Highly Epitaxial LaNiO3 Films from a Propionate-based Solution**
R.B. MOS, M. NASUI, T. PETRISOR Jr., M. GABOR, A. MESAROS, L. CIONTEA, T. PETRISOR, Center for Superconductivity, Spintronics and Surface Science, Technical University of Cluj-Napoca, Cluj-Napoca, Romania

CH-5:IL06 **Photochromic Properties of Thin Films of Oxidized Yttrium Hydride**
S.Zh. KARAZHANOV[1], J. MONTERO[1], D. MOLDAREV[1,2], A. TABATABAEI[3], E. MURAT BABA[3], E. STRUGOVSHCHIKOV[4], CH.CH. YOU[1], A. PISHTSHEV[4], D. PRIMETZHOFER[2], H. PALONEN[2], M. WOLFF[2], E.O. ZAYIM[3], E.S. MARSTEIN[1], [1]Department for Solar Energy, Institute for Energy Technology, Kjeller, Norway; [2]Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden; [3]Istanbul Technical University, Istanbul, Turkey; [4]Institute of Physics, University of Tartu, Tartu, Estonia

CH-5:IL07 **Antifouling Coatings: Adhesion Mechanisms of Micro-organisms**
C. TENDERO, CIRIMAT / INPT-ENSIACET, Toulouse, France

CH-5:IL08 **Novel Ceramic and Layered Thin-film Materials for Contacts and Thermoelectric Applications**
P. EKLUND, Energy Materials Group, Thin Film Physics Division, Dept. of Physics, Chemistry and Biology (IFM), Linköping University, Linköping, Sweden

CH-5:L09 **Superhydrophilic Coatings: Study and Improvement of the Sol-Spray Fabrication of ZnO-Based Self-Cleaning Ceramic Surfaces**
F.D. RODRIGUEZ-VILLALOBOS[1], J.J. RUIZ-VALDES[1], V. BARBIERI[2], C. SILIGARDI[2], E.I. CEDILLO-GONZALEZ[1], [1]Universidad Autónoma de Nuevo León, Facultad de Ciencias Químicas, San Nicolás de los Garza, N.L., México; [2]Università degli Studi di Modena e Reggio Emilia, Dipartimento di Ingegneria "Enzo Ferrari", Modena, Italy

CH-5:L10 **High-performance Hybrid Nanocomposites Based on Waterborne Polyurethane and Hydrophobic Fumed Silica by In Situ Polymerization**
YANTING HAN, JINLIAN HU, Institute of Textiles and Clothing, the Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong, China; ZHONGYIN XIN, Sichuan University, National Engineering Laboratory for Clean Technology of Leather Manufacture, Chengdu, Sichuan, China

Session CH-6
Modelling and Simulation of Coatings and Films

CH-6:IL01 **Finite Element (FE) Modelling of Thermal Spray Coatings: Case Studies**
G. BOLELLI, L. LUSVARGHI, T. MANFREDINI, P. PUDDU, V. TESTA, University of Modena and Reggio Emilia, Modena, Italy

CH-6:IL02 **Multi-scale Modelling of Thin Films and Coatings for Scientific and Industrial Outcomes**
H. RONKAINEN, A. LAUKKANEN, K. HOLMBERG, T. ANDERSSON, T. SUHONEN, VTT Technical Research Centre of Finland Ltd, Espoo, Finland

CH-6:IL03 **Reactive Sputter Deposition Visualized by Modelling**
D. DEPLA, K. STRIJCKMANS, R. SCHELFHOUT, Department of Solid State Sciences, Ghent University, Gent, Belgium

CH-6:L04 **Friction Regimes of Water-lubricated Diamond (111): The Role of Interfacial Ether Groups and Tribo-induced Aromatic Surface Reconstructions**
TAKUYA KUWAHARA[1], G. MORAS[1], **M. MOSELER**[1,2], [1]Fraunhofer IWM, MicroTribology Center μTC, Freiburg, Germany; [2]Institute of Physics, University of Freiburg, Freiburg, Germany

Session CH-7
Industrial Processing in Advanced Surface Technologies

CH-7:IL01 **Generation and Optimization of Robot Trajectory in Thermal Spraying**
SIHAO DENG, CHAOYUE CHEN, R. BOLOT, G. MONTAVON, **HANLIN LIAO**, LERMPS, ICB UMR 6303, CNRS, Univ. Bourgogne Franche-Comté, UTBM, Belfort, France

CH-7:IL02 **Scratch-resistant Transparent Sapphire Coating by Aerosol Deposition for Cover Glass Application of Smart Phone**
JAE-HYUK PARK, DAE-GUN KIM, JONGWOO LIM, HYE-WON SEOK, MYUNG-NO LEE, BYUNG-KI KIM, IONES Co.,Ltd., Anseong-si, Gyeonggi-do, South Korea

CH-7:IL03 **Protective and Functional Coatings in Pulp and Paper Applications: From Wear Resistance to Anti-sticking Surfaces**
P. VUORISTO, Tampere University of Technology Laboratory of Materials Science, Tampere, Finland

CH-7:IL04 **Highly Ionized Deposition of Hard Coatings**
H. GERDES, R. BANDORF, K. ORTNER, M. VERGÖHL, G. BRÄUER, Fraunhofer Institute for Surface Engineering and Thin Films IST, Braunschweig, Germany

SYMPOSIUM CI
POROUS CERAMICS FOR ENVIRONMENTAL PROTECTION, ENERGY-RELATED TECHNOLOGIES AND ADVANCED INDUSTRIAL CYCLES

Session CI-1
Novel Synthesis and Processing

CI-1:IL01 **Colloidal Processing of CeO2 Pellets with Hierarchical Porosity as Spent Fuel Matrix Analogue**
S. FERNANDEZ, J. COBOS, Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT), Madrid, Spain; **R. MORENO**, Instituto de Cerámica y Vidrio, Consejo Superior de Investigaciones Científicas, Madrid, Spain

CI-1:IL02 **Novel Processing of Open Celled Glass and Glass-ceramic Foams**
E. BERNARDO, A. RINCON ROMERO, P. RABELO MONICH, H. ELSAYED, Università degli Studi di Padova, Dipartimento di Ingegneria Industriale, Padova, Italy

CI-1:IL03 **Fabrication of Porous Si3N4/SiC Ceramics via Rapid Nitridation Processing and ZrO2 as Catalyst**
YUPING ZENG, Shanghai institute of Ceramics, CAS, Shanghai, China

CI-1:IL04 **Additive Manufacturing of Porous Ceramics using Inorganic Polymers**
P. COLOMBO, University of Padova, Dept. Industrial Engineering, Padova, Italy

CI-1:L05 **Preparation of Low-cost Gangue Porous Ceramic Micro-spheres for Wastewater Adsorption**
SHU YAN[1], YIMING PAN[2], KE GAN[1], JINLONG YANG[1,2], [1]State Key Laboratory of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing, P.R. China; [2]School of Materials Science and Engrg, Dalian Jiaotong University, Dalian, Liaoning, P.R. China

CI-1:L06 **Solidification Templating of Porous Polysilazane-derived Ceramics**
T. KONEGGER, R. OBMANN, TU Wien, Institute of Chemical Technologies and Analytics, Vienna, Austria

CI-1:L07 **Geopolymer Foams Incorporating Silicate Waste**
N. TONIOLO, A.R. BOCCACCINI, Institute of Biomaterials, University of Erlangen-Nuremberg, Erlangen, Germany; A. RINCON, E. BERNARDO, Department of Industrial Engineering, University of Padova, Padova, Italy

CI-1:IL08 **Uniformly Porous Ceramics with 3-D Network Structure (UPC-3D) Prepared by Pyrolytic Reactive Sintering**
YOSHIKAZU SUZUKI, Faculty of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Ibaraki, Japan

CI-1:IL09 **Reticulated Porous Ceramics – Cellular Stuctures for a Multitude of Functionalization Strategies**
M. SCHEFFLER, S. RANNABAUER, Inst. of Material and Joining Technology, University of Magdeburg, Germany; U. BETKE, A. LIEB, F. SCHEFFLER, Inst. of Industrial Chemistry, University of Magdeburg, Germany

CI-1:L10 **Porous Glass-ceramics from Alkali Activation and Sinter-crystallization of Waste Glass Mixtures**
P. RABELO MONICH[1], A. RINCON ROMERO[1], D. HÖLLEN[2], E. BERNARDO[1], [1]Dipartimento di Ingegneria Industriale, Università degli Studi di Padova, Padova, Italy; [2]Chair of Waste Processing Technology and Waste Management, Montanuniversität Leoben, Leoben, Austria

CI-1:L11 **Synthesis and Properties of Macroporous SiC Ceramics by 3D-printing and Chemical Vapor Infiltration/Deposition**
A. BAUX, S. JACQUES, **G. CHOLLON**, LCTS, CNRS, Pessac, France; T. PIQUERO, D. ROCHAIS, P. DAVID, CEA-DAM, Le Ripault, Monts, France

CI-1:L12 **Glass Ceramic Foams from Vitrified Wastes Produced by Inorganic Gel Casting and Sinter-crystallization**
A. RINCON, E. BERNARDO, Department of Industrial Engineering, University of Padova, Padova, Italy; M. SALVO, Department of Applied Science and Technology, DISAT, Politecnico di Torino, Torino, Italy

CI-1:IL13 **From Micro to Ultra-Macro Porosity in Alkali Bonded Ceramics (Geopolymers)**
E. PAPA, A. NATALI MURRI, E. LANDI, V. MEDRI, CNR-ISTEC, Faenza, Italy

CI-1:L14 **Processing and Application of Porous TiC-Carbon Nanocomposites for Radioactive Ion Beam Production at CERN-ISOLDE**
J.P. RAMOS, T. STORA, CERN, Geneva, Switzerland; A.M.R. SENOS, C.M. FERNANDES, CICECO, Aveiro, Portugal; **P. BOWEN**, EPFL, Switzerland

CI-1:L15 **High Content SiO2 Porous Glass Ceramics for High Temperature Applications and their Properties**
L. ORTMANN, F.P. LUDWIG, U. HEIZE, QSIL GmbH Quarzglasschmelze Ilmenau, Langewiesen, Germany; H. RICHTER, IKTS Hermsdorf, Germany

CI-1:L16 **Effect of Starch Addition on the Cordierite Membranes Performances**
W. MISRAR[1,2,3], M. LOUTOU[4], L. SAADI[2], M. MANSORI[1], Y. RAKHILA[5], S. VILAIN[3], M. WAQIF[2], C. FAVOTTO[3], [1]LCME, Laboratoire de Chimie des Matériaux et d'Environnement, Faculté des Sciences et Techniques, Université Cadi Ayyad, Marrakech, Morocco; [2]LMCN, Laboratoire de Matière Condensée et Nanostructures, Faculté des Sciences et Techniques, Université Cadi Ayyad, Marrakech, Morocco; [3]IM2NP, Institut Matériaux Microélectronique Nanosciences de Provence, Université de Toulon, Bât R, La Garde-Cedex, France; [4]Faculté Pluridisciplinaire de Nador, Université Mohammed 1er, Selouane, Nador, Morocco; [5]Laboratoire de chimie physique et de chimie biorganique, Faculté des Sciences et Techniques Mohammedia, Université Hassan II de Casablanca, Mohammedia, Morocco

CI-1:IL17 **Controlling Pore Structure of Porous Ceramics Fabricated by the Gel-casting Method**
YUNZI XIN, DAISUKE ASAI, JEONGSOO HONG, TAKASHI SHIRAI, Advanced Ceramics Research Center, Nagoya Institute of Technology, Nagoya, Aichi, Japan

CI-1:L18 **Tailoring the Microstructure of TiO2 Photoactive Electrodes by using Cellulose Nanofibers and by Polyelectrolyte Multilayer Absorption**
Z. GONZALEZ GRANADOS[1], J. YUS[1], A.J. SANCHEZ-HERENCIA[1], A. RODRÍGUEZ[2], J. DEWALQUE[3], L. MANCERIU[3], C. HENRIST[3], B. FERRARI[1], [1]Institute of Ceramics and Glass, CSIC, Tailoring through Colloidal Processing Group 5, Madrid, Spain; [2]Chemical Engineering Department, University of Cordoba, Campus de Rabanales, Cordoba, Spain; [3]University of Liege, Group of Research in Energy and Environment from Materials (GREENMAT), Liege, Belgium University

CI-1:L19 **Structural Features of Thin Nanoporous Anodic Aluminum Oxide (AAO) Templates on ITO/Glass Substrate**
K.M. CHAHROUR, M.R. HASHIM, Institute of Nano-optoelectronics Research and Technology (INOR), Universiti Sains Malaysia, Penang, Malaysia

Session CI-2
Absorption, Capillary Phenomena and Thermophysical Behaviour

CI-2:IL01 **Ceramic Components with Hierarchical Porosity**
C. VAKIFAHMETOGLU, Department of Materials Science and Engineering, Izmir Institute of Technology, Urla, Izmir, Turkey

CI-2:IL02 **Thermophysical Behaviour of Porous Ceramics in Atmospheres with Controlled Humidity. Relevance to Drying of Green Bodies**
B. NAIT-ALI, S. OUMMADI, A. ALZINA, C. DANGLADE, M. ZOUAOUI, D.S. SMITH, University of Limoges, Limoges, France

CI-2:IL03 **Hierarchically Porous Metal Hydroxides Through an Assembly of Crystalline Nanobuilding Blocks**
YASUAKI TOKUDOME, M. TAKAHASHI, Department of Materials Science, Graduate School of Engineering, Osaka Prefecture University, Sakai, Japan

CI-2:IL04 **Low Temperature Processing of Silicon Carbide Membranes for Wastewater Treatment**
YOUNG-WOOK KIM, HEE-JONG YEOM, HUI-YING SHENG, Functional Ceramics Laboratory, Department of Materials Science and Engineering, University of Seoul, Seoul, South Korea

CI-2:L05 **Micro-meso Porous Alkali Bonded Ceramics as Solid Adsorbent for CO2 Capture**
V. MEDRI[1], E. PAPA[1], E. LANDI[1], F. MICCIO[1], M. MINELLI[2], F. DOGHIERI[2], P. BENITO[3], A. VACCARI[3], [1]CNR-ISTEC, Faenza, Italy; [2]Department of Civil, Chemical Environmental and Materials Engineering (DICAM), Alma Mater Studiorum - University of Bologna, Italy; [3]"Toso Montanari" Department of Industrial Chemistry, Alma Mater Studiorum - University of Bologna, Italy

Session CI-3
Structure and Functional, Mechanical and Thermal Properties of Porous Ceramics; Structure/Transport/Functional Properties Relationships

CI-3:IL01 **Mechanical Properties of Porous Ceramics**
S. MEILLE, Université de Lyon, INSA de Lyon, MATEIS UMR CNRS 5510, Villeurbanne, France

CI-3:IL02 **Oxidation-bonded SiC Membrane for Water Treatment**
IN-HYUCK SONG, S.Z.A. BUKHARI, J.H. HA, J.M. LEE, Korea Institute of Materials Science (KIMS), Changwon, Gyeongnam, South Korea

CI-3:IL03 **Material Design for High Temperature Application**
F. RAETHER, G. SEIFERT, Fraunhofer Center for High Temperature Materials and Design (HTL), Bayreuth, Germany

CI-3:IL04 **Hydrogen-selective Si-based Inorganic-organic Hybrid Membranes for Solar Hydrogen Production via Photoelectrochemical Water-splitting**
YUJI IWAMOTO, Nagoya Institute of Technology, Nagoya, Japan

CI-3:L05 **Aerogel Based Composites for Applications in Energy Technologies**
G. REICHENAUER, **C. SCHERDEL**, ZAE Bayern, Wuerzburg, Germany

CI-3:L06 **Hydrophobic Ceramic Capillary Membranes for Controlled Virus Retention**
J. BARTELS[1], M. MAAS[1, 2] K. REZWAN[1, 2], [1]University of Bremen, Advanced Ceramics, Bremen, Germany; [2]MAPEX Centre of Materials and Processes, University of Bremen, Bremen, Germany

CI-3:L07 **Impact of Illite Clay and Sintering Conditions on Development of Porous Cordierite Ceramics**
M. RUNDANS, G. SEDMALE, L. GRASE, Riga Technical University, Institute of Silicate Materials, Riga, Latvia; K. BALTAKYS, Kaunas University of Technology, Faculty of Chemical Technology, Department of Silicate Technology, Kaunas, Lithuania

Session CI-4

Advances in the Characterization of the Porous Structures

CI-4:IL01 **2D and 3D Imaging Characterization Techniques for Porous Ceramics**
G. BRUNO, BAM, Bundesanstalt für Materialforschung und –prüfung, Berlin, Germany

CI-4:IL02 **Characterization of Porous Ceramics via *μ*CT**
T. FEY, Chair of Glass and Ceramics, University Erlangen-Nürnberg, Erlangen, Germany

CI-4:L03 **Synthesis and Characterization of Xerogel and Aerogel Nanocomposites Based on Platinum Dispersed in Sol-gel Silica**
N. DELLA SANTINA MOHALLEM[1], J. BATISTA DA SILVA[2], [1]Laboratory of Nanostructured Materials, UFMG, Brazil; [2]CDTN/CNEN, Brazil

CI-4:L04 **Environmental Remediation of Silicon Oxycarbide (SiCO) Porous Materials**
S. AGUIRRE-MEDEL, P. KROLL, Chemistry and Biochemistry Department, University of Texas, Arlington, TX, USA

CI-4:L05 **Spatially Resolved NMR Study of Regular and Irregular Ceramic Catalysts by Thermally Polarized Gas**
M. MIRDRIKVAND, W. DREHER, DFG Research Training Group MIMENIMA (Micro-, meso- and macroporous nonmetallic Materials), In-vivo-MR Group, Department of Chemistry, University of Bremen, Bremen, Germany

Session CI-5

Modeling and Simulation of Porous Structure and Properties

CI-5:IL01 **Modelling of the Thermal Properties of Porous Ceramics: From Green to Fired Bodies**
D.S. SMITH, B. NAIT-ALI, S. OUMMADI, F. PUECH, D. NOUGUIER, A. ALZINA, Institute of Research for Ceramics (CNRS UMR 7315), University of Limoges, Limoges, France

CI-5:IL02 **Modelling of Porous Ceramics Produced by Additive Manufacturing**
A. ORTONA, SUPSI, Manno, Switzerland

CI-5:IL03 **Modeling and Simulation of Porous Materials with Microstructures of Triply Periodic Minimal Surfaces**
R. ABU AL-RUB[1], O. AL-KETAN[1], DONG-WOOK LEE[1], ALIA ABU ALI[1], R. REZGUI[2], R. ROWSHAN[3], [1]Masdar Institute, Khalifa University of Science and Technology, Abu Dhabi, UAE; [2]Core Technology Platforms, New York University Abu Dhabi, Abu Dhabi, UAE

Session CI-6

Progress in Applications of Porous Ceramics

CI-6:IL01 **Additively-manufactured Reactors for the Intensification of H2 Production by Steam Methane Reforming: Fabrication, Functionalization and Recycling Issues**
F. ROSSIGNOL, T. CHARTIER, B. TROUILHET, IRCER, UMR CNRS 7315, Limoges cedex, France; B. CROISSANT, R. FAURE, P. DEL GALLO, AIR LIQUIDE, CRPS, Jouy en Josas, France

CI-6:L02 **Development of Small Scale Ceramic Microbial Fuel Cells for Clean Energy Extraction from Urine**
I. GAJDA, X.A. WALTER, T. OBATA, J. GREENMAN, I. IEROPOULOS, Bristol BioEnergy Centre, BRL, T-Bloc, University of the West of England, Bristol, UK

CI-6:L03 **Transesterification of Soybean Oil using Geopolymers as Heterogeneous Catalysts**
R.F. BOTTI[1], M.D.M. INNOCENTINI[2], P. PASTORE[3], L.R. SAN GREGORIO[2], P. COLOMBO[1], [1]Department of Industrial Engineering, University of Padova, Padova, Italy; [2]Course of Chemical Engineering, University of Ribeirão Preto, Ribeirão Preto-SP, Brazil; [3]Department of Chemical Sciences, University of Padova, Padova, Italy

CI-6:L04 **Ultrasmall Mesoporous Silica: A Better Catalysis Support**
JIASHENG WANG, W. WU, W.H. WANG, M. BAO, School of Petroleum and Chemical Engineering, Dalian University of Technology, Panjin, China

CI-6:IL05 **Polymer-derived Mesoporous Ceramics as Catalysis Supports and Co-catalysts for Hydrogen Generation**
A. LALE[1], U.B. DEMIRCI[2], **S. BERNARD**[1], [1]Institut de Recherche sur les céramiques (IRCER) UMR 7315 CNRS-Centre Européen de la Céramique, Limoges Cedex, France; [2]Institut Européen des Membranes - IEM UMR 5635, Université de Montpellier, Montpellier Cedex, France

CI-6:IL06 **High Performance Porous Ceramics for Energy Related Applications**
J. GURAUSKIS[1, 2], **V. GIL**[1, 3], [1]Fundación Agencia Aragonesa para la Investigación y Desarrollo (ARAID), Zaragoza, Spain; [2]AENEAM Advanced Membrane Technologies S.L., Zaragoza, Spain; [3]Fundación Nuevas Tecnologías del Hidrógeno en Aragón, Parque Tecnológico Walqa, Huesca, Spain

CI-6:L07 **Design Approach for Porous Ceramics in Concentrated Solar Power Application**
J. ADLER, A. FÜSSEL, W. BECKERT, Fraunhofer IKTS, Dresden, Germany; F. ZAVERSKY, L. ALDAZ, M. SÁNCHEZ, National Renewable Energy Center (CENER), Solar Thermal Energy Department, Spain; A.L. AVILA-MARIN, M. ISABEL ROLDAN, J. FERNANDEZ-RECHE, CIEMAT-Plataforma Solar de Almeria, Spain

CI-6:L08 **Enzyme-modified Porous Ceramic Capillaries for Continuous Flow Hydrolysis of Proteins**
M.M. HOOG ANTINK[1], T. SEWCZYK[2], S. KROLL[3], S. BEUTEL[2], M. MAAS[1], K. REZWAN[1], [1]Advanced Ceramics, University Bremen, Bremen, Germany; [2]Institute for Technical Chemistry, Leibniz University Hannover, Hannover, Germany; [3]Institute for Bioplastics and Biocomposites, Hochschule Hannover, Hannover, Germany

CI-6:IL09 **Particle-stabilized Foams: From Satellite Housings to High Performance Insulators and Fire Protection Materials**
U.T. GONZENBACH, P.N. STURZENEGGER, de Cavis Ltd., Duebendorf, Switzerland

CI-6:IL10 **Porous Geopolymers for Indoor Humidity Control**
I. LANCELLOTTI[1], J. KIVENTERA[2], M. ILLIKAINEN[2], C. LEONELLI[1], [1]Department of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia, Modena, Italy; [2]University of Oulu, Fiber and Particle Engineering, University of Oulu, Oulu, Finland

CI-6:L11 **Emission Studies of Hydrogen Combustion for Cooking and Heating on Catalytic Coated Ceramic Foams**
U.F. VOGT, T. BUETLER, B. FUMEY, EMPA, Duebendorf, Switzerland

CI-6:L12 **DOE Analysis of Taylored Porosity Alumina Supports Obtained by Sintering in Two Steps**
F.N. MATTOS, L. CALDEIRA, IF Sudeste MG, Juiz de Fora, MG, Brazil

SYMPOSIUM CJ

ADVANCES IN ELECTROCERAMICS: PROCESSING, STRUCTURE, PROPERTIES, AND APPLICATIONS

Session CJ-1

Dielectrics and Microwave Materials

CJ-1:IL01 **Ultra-Low Temperature Co-fired Ceramics (ULTCC) – Current Situation and What is Needed for Industrial Applications**
J. VARGHESE, M.Y. CHEN, N. JOSEPH, M. SOBOCINSKI, **H. JANTUNEN**, Microelectronics Research Unit, University of Oulu, Faculty of Information Technology and Electrical Engineering, Oulu, Finland

CJ-1:IL02 **Microwave and THz Characterization of Electroceramics**
D. JABLONSKAS, M. IVANOV, J. MACUTKEVIC, S. RUDYS, R. GRIGALAITIS, S. LAPINSKAS, S. SVIRSKAS, **J. BANYS**, Vilnius University, Vilnius, Lithuania

CJ-1:IL03 **Ultralow Temperature Cofiring Ceramics for LTCC Applications**
HONG WANG, Department of Materials Science and Engineering, Southern University of Science and Technology, Shenzhen, China & State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University, Xi'an, China

CJ-1:L04 **Electrical Resistivity of Silicon Nitride Produced by Various Methods**
O. LUKIANOVA, Belgorod State National Research University, Belgorod, Russia

CJ-1:L05 **Aluminiumoxide and Hafniumoxide as Nonlinear Dielectrics**
L. KANKATE, H. KLIEM, Institute of Electrical Engineering Physics, Saarland University Campus A5, Saarbruecken, Germany

CJ-1:L06 **Rheological Aspects of Formation Thin Smooth Nanostructured Ceramic Films by Screen-printing Method**
S.O. UMEROVA, A.V. RAGULYA, Frantsevich Institute for Problems of Materials Science of NASU, Ukraine

CJ-1:L07 **Ceramics Materials and Microelectronic Energy Frontiers**
V.V. MITIC[1, 2], V. PAUNOVIC[1], N. CVETKOVIC[1], G. LAZOVIC[3], L. KOCIC[1], [1]University of Nis, Faculty of Electronic Engineering, Nis, Serbia; [2]Institute of Technical Sciences of SASA, Belgrade, Serbia; [3]University of Belgrade, Faculty of Mechanical Engineering, Belgrade, Serbia

Session CJ-2
Ferroelectric, Piezoelectric, Pyroelectric, and Ferroelastic Ceramics

CJ-2:IL01 **Symmetry Breaking in Bulk Ceramics and Crystals**
D. DAMJANOVIC, S. HASHEMIZADEH, Group for Ferroelectrics and Functional Oxides, Swiss Federal Institute of Technology - EPFL, Lausanne, Switzerland; E. OVEISI, S. DE ZANET, Interdisplinray Centre for Electron Microscopy, EPFL, Switzerland; T. HOSHINA, Tokyo Institute of Technology, Tokyo, Japan; A. BENCAN, T. ROJAC, Jozef Stefan Institute, Ljubljana, Slovenia; G. DRAZIC, National Institute of Chemistry, Ljubljana, Slovenia

CJ-2:IL02 **Domain Walls in Multiferroic Bismuth Ferrite: An Ab Initio Study**
O. DIEGUEZ, Department of Materials Science and Engineering, Tel Aviv University, Tel Aviv, Israel

CJ-2:IL03 **Niobate Based Lead-free Ceramics for Piezoelectric and Energy Storage Applications**
JING-FENG LI, School of Materials Science and Engineering, Tsinghua University, Beijing, China

CJ-2:IL04 **Tuning of the Depolarization Field, Built-in Voltage and Nanodomain Structure in Ferroelectric Thin Films and Superlattices**
C. LICHTENSTEIGER[1], S. FERNANDEZ-PENA[1], C. WEYMANN[1], P. ZUBKO[2], P. PARUCH[1], J.-M. TRISCONE[1], [1]Department of Quantum Matter Physics, University of Geneva, Geneva, Switzerland; [2]London Center for Nanotechnology and Department of Physics and Astronomy, University College London, London, UK

CJ-2:IL05 **Nanoscale Susceptibilities in Ferroelectric Thin Films: Insights from Multidimensional Spectroscopy and Machine Learning**
L. MARTIN, **J. AGAR**, University of California at Berkeley, USA

CJ-2:L06 **Process and Electromechanical Properties of Thick Films Based on Lead-free Sol-gel BHT**
P. BOY[1], T. RICHARDOT, P. BELLEVILLE, CEA Le Ripault, Monts, France ; F. LEVASSORT, Université François Rabelais, GREMAN, Tours, France

CJ-2:L07 **Designing Pseudocubic Perovskite Solid Solutions with Enhanced Nanoscale Polarization**
I. LEVIN, W.J. LAWS, D. WANG, I.M. REANEY, National Institute of Standards and Technology, Gaithersburg, MD, USA

CJ-2:L08 **New Diagnostic Technique to Control Grain-boundary Conduction in Thin Perovskite Ferroelectric Films**
L.A. DELIMOVA, E.V. GUSCHINA, V.S. YUFEREV, Ioffe Institute of the RAS, Saint-Petersburg, Russia; D.S. SEREGIN, K.A. VOROTILOV, A.C. SIGOV, Moscow Technological University (MIREA), Moscow, Russia

CJ-2:IL09 **Iron's Valence Control of BiFeO3-based Piezoelectric Ceramics for Property Enhancement**
SATOSHI WADA[1], T. AIZAWA[1], S. UENO[1], I. FUJII[1], N. KUMADA[1], C. MORIYOSHI[2], Y. KUROIWA[2], [1]Material Science and Technology, University of Yamanashi, Yamanashi, Japan; [2]Department of Physical Science, Hiroshima University, Hiroshima, Japan

CJ-2:IL10 **Deposition of Epitaxial and Composite Ferroelectrics Directly on Silicon**
C. DUBOURDIEU, Helmholtz Zentrum Berlin für Materialien und Energie, Berlin, Germany; L. MAZET, Institut des Nanotechnologies de Lyon, CNRS, ECL, Ecully, France; M.M. FRANK, E. CARTIER, J. BRULEY, V. NARAYANAN, IBM T.J. Watson Research Center, Yorktown Heights, NY, USA; S.M. YANG, Department of Physics, Sookmyung Women's University, Seoul, South Korea; R. K. VASUDEVAN, S.V. KALININ, CNMS, Oak Ridge National Laboratory, Oak Ridge, TN, USA; C. MAGEN, LMA-INA, Universidad de Zaragoza, Zaragoza, Spain; S. SCHAMM-CHARDON, CEMES-CNRS, Université de Toulouse, Toulouse, France

CJ-2:L11 **Accurate Determination of Material Coefficients from Electromechanical Resonances of Lead-free Ba1-xCaxTi0.9Zr0.1O3 (x=0.10-0.18) Mixed Oxide Ceramics**
A. REYES[1], M.E. VILLAFUERTE-CASTREJÓN[1], A. GARCÍA[2], A.M. GONZALEZ[3], **L. PARDO**[2], [1]Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México, D.F. Mexico; [2]Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), Cantoblanco, Madrid, Spain; [3]CEMDATIC, ETSIS, Campus Sur, Universidad Politécnica de Madrid, Madrid, Spain

CJ-2:L12 **Polarization in Ferroelectric Tungsten Bronzes**
G.H. OLSEN, S. STUBMO AAMLID, S.M. SELBACH, **T. GRANDE**, Department of Materials Science and Engineering, NTNU Norwegian University of Science and Technology, Trondheim, Norway

CJ-2:L13 **Enhanced Piezoelectric Properties in PNZT-ZrO2 Composites at Low Frequencies**
M. ACUAUTLA, S. DAMERIO, V. OCELIK, B. NOHEDA, Zernike Institute for Advanced Materials, University of Groningen, Groningen, The Netherlands

CJ-2:L14 **Structure-bandgap Relationship in Ba(M,Ti)O3 Ferroelectric Solid Solutions**
H. VOLKOVA[1], P. GEMEINER[1], J. GUILLOT[2], D. LENOBLE[2], N. CHAUVIN[3], F. KAROLAK[1], C. BOGICEVIC[1], B. DKHIL[1], I.C. INFANTE[3], [1]Laboratoire SPMS, CentraleSupelec, CNRS-UMR8580, Universite Paris-Saclay, Gif-sur-Yvette, France; [2]Luxembourg Institute of Science and Technology (LIST), Materials Research and Technology (MRT) Department, Belvaux, Luxembourg; [3]Institut des Nanotechnologies de Lyon (INL), CNRS-UMR5270 ECL INSA UCBL CPE, Villeurbanne Cedex, France

CJ-2:L15 **Soft Mode and Microwave Dielectric Relaxation in Low-lead BT-PMN Ceramics**
V. BOVTUN, D. NUZHNYY, M. KEMPA, T. OSTAPCHUK, J. PETZELT, S. KAMBA, Institute of Physics CAS, Prague, Czech Rep.; J. SUCHANICZ, K. KONIECZNY, Pedagogical University, Cracow, Poland

CJ-2:L16 **Modeling the Size Effects in Ferroelectric Ceramics with Different Grain Sizes**
L. PADURARIU, C. CIOMAGA, L. CURECHERIU, L. MITOSERIU, Faculty of Physics, Al. I. Cuza University of Iasi, Iasi, Romania

CJ-2:L17 **Impedance Spectroscopy Analysis of Ca doped BaTiO3 Ferroelectric Ceramic**
A. SALHI, S. SAYOURI, L.H. OMARI, LPTA, Département de Physique, Faculté des Sciences-DM, Fès-Atlas, Maroc; A. ALIMOUSSA, L. HAJJI, Laboratoire LMCN, Faculté des Sciences et Technique Gueliz Marrakech, Maroc; L. KADIRA, Laboratoire de physique chimie, CRMEF-Fès, Maroc

CJ-2:L18 **Simultaneous Characterization of Charge and Structural Motion during Ferroelectric Polarization Reversal**
C. KWAMEN[1], M. RÖSSLE[2], M. REINAARDT[1], W. LEITENBERGER[2], F. ZAMPONI[2], M. ALEXE[3], M.BARGHEER[1, 2], [1]Helmholtz Zentrum Berlin, Berlin, Germany; [2]Institute of Physics University of Potsdam, Germany; [3]Department of Physics, University of Warwick, UK

CJ-2:L19 **Processing and Properties of Lead-free BiFeO3-SrTiO3 Piezoceramics**
M. MAKAROVIC[1, 2], A. BENCAN[1, 2], B. MALIC[1, 2], T. ROJAC[1, 2], [1]Electronic Ceramics Department, Jozef Stefan Institute, Ljubljana, Slovenia; [2]Jozef Stefan International Postgraduate School, Ljubljana, Slovenia

CJ-2:L20 **Dead-layer Analysis in Ferroelectric Thin Films**
A. SIGOV, Yu. PODGORNY, K. VOROTILOV, Moscow Technological University (MIREA), Moscow, Russia

CJ-2:L21 **Effect of Mg-Nb Addition to AlN Piezoelectric Thin Film**
MASATO UEHARA, Y. FUJIO, T. NAGASE, M. AKIYAMA, AIST, Tosu, Saga, Japan; H. SHIGEMOTO, Kyushu University, Kasuga, Fukuoka, Japan; Y. AIDA, K. UMEDA, Murata Manufacturing Co., Ltd., Nagaokakyo, Kyoto, Japan

CJ-2:IL22 **Morphotropic Phase Boundaries in Polycrystalline Relaxor-ferroelectrics**
M. OTONICAR, H. URSIC, B. JANCAR, A, BENCAN, B. MALIC, T. ROJAC, Jozef Stefan Institute, Ljubljana, Slovenia; G. ESTEVES, J.L. JONES, Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC, USA

Session CJ-3
Multiferroics and Magnetoelectric Ceramics

CJ-3:IL01 **Charged Defects and Domain Walls in Polycrystalline BiFeO3**
T. ROJAC, A. BENCAN, H. URSIC, B. JANCAR, M. MAKAROVIC, A. BRADESKO, B. MALIC, Jozef Stefan Institute, Ljubljana, Slovenia; G. DRAZIC, National Institute of Chemistry, Ljubljana, Slovenia; L. LIU, J.E. DANIELS, University of New South Wales, Sydney, NSW, Australia; D. DAMJANOVIC, Swiss Federal Institute of Technology, Lausanne, Switzerland

CJ-3:IL02 **Magnetoelectricity at the Antiperovskite/Perovskite Interface**
DING-FU SHAO, T.R. PAUDEL, **E.Y. TSYMBAL**, Department of Physics and Astronomy, University of Nebraska, Lincoln, NE, USA

CJ-3:IL03 **Magnetic Energy Harvesting by Magnetoelectric Composite Structure for Ubiquitous Self-powered Autonomous IoT Systems**
DAE-YONG JEONG[1], GEON-TAE HWANG[2], WOON-HA YOON[2], SHASHANK PRIYA[3], JUNGHO RYU[2], [1]Inha University, Incheon, South Korea; [2]Korea Institute of Materials Science, South Korea; [3]Pennsylvania State University, USA

CJ-3:IL04 **Cool - Spark Plasma Sintering: Exploring Fragile Ferroic Ceramics and Beyonds**
T. HERISSON DE BEAUVOIR, A. SANGREGORIO, I. CORNU, V. VILLEMOT, C. ELISSALDE, D. MICHAU, U-C. CHUNG-SEU, **M. JOSSE**, ICMCB-CNRS, Université de Bordeaux, UPR 9048 CNRS, Pessac, France

CJ-3:IL05 **Multiferroic (Nd,Fe)-doped PbTiO3 Ceramics with Coexistent Ferroelectricity and Magnetism at Room Temperature**
F. CRACIUN, CNR Istituto dei Sistemi Complessi, Area della Ricerca di Roma-Tor Vergata, Rome, Italy

CJ-3:IL06 **Real-space Imaging of the Spin Cycloid in BiFeO3 Thin Films**
V. GARCIA, K. GARCIA, C. CARRETERO, A. BARTHELEMY, M. BIBES, S. FUSIL, Unite Mixte de Physique, CNRS, Thales, Univ. Paris Sud, Universite Paris-Saclay, Palaiseau, France; I. GROSS, W. AKHTAR, L.J. MARTINEZ, S. CHOUAIEB, V. JACQUES, Laboratoire Charles Coulomb, Universite de Montpellier and CNRS, Montpellier, France; J.-Y. CHAULEAU, M. VIRET, SPEC, CEA, CNRS, Université Paris-Saclay, Gif-sur-Yvette, France; P. APPEL, P. MALETINSKY, Department of Physics, University of Basel, Basel, Switzerland

CJ-3:L07 **Ferroelectric Properties of Bi(Fe,Sc)O3 Ceramics Addressed by Piezoresponse Force Microscopy**
V.V. SHVARTSMAN, Institute for Material Science, University of Duisburg-Essen, Essen, Germany; A.N. SALAK, Department of Materials and Ceramic Engineering/CICECO, University of Aveiro, Aveiro, Portugal; D.D. KHALYAVIN, ISIS Facility, Rutherford Appleton Laboratory, Chilton, Didcot, UK

CJ-3:L08 **Complex Functional Characterization of Percolative CoFe2O4-PbTiO3 Composite Ceramics**
C.E. CIOMAGA[1], M. AIRIMIOAEI[2], I. TURCAN[2], A.V. LUKACS[2], L. PADURARIU[2], S. BALCIUNAS[3], J. BANYS[3], L. MITOSERIU[2], [1]Research Department, Faculty of Physics, Dielectrics, Ferroelectrics & Multiferroics Group, Al. I. Cuza Univ. of Iasi, Iasi, Romania; [2]Dielectrics, Ferroelectrics & Multiferroics Group, Faculty of Physics, "Al. I. Cuza" University of Iasi, Iasi, Romania; [3]Faculty of Physics, Vilnius University, Vilnius, Lithuania

Session CJ-4
Semiconducting Ceramics

CJ-4:IL01 **Gas Sensing with Semiconducting Metal Oxide Nanostructures**
TETSUYA KIDA, Division of Materials Science, Faculty of Advanced Science and Technology, Kumamoto University, Kumamoto, Japan

CJ-4:IL02 **Mechanically Tuned Conductivity in Piezoelectric Semiconductors**
N. NOVAK[1, 2], T. FRÖMLING[1], J. RÖDEL[1], [1]Institute of Materials Science, Technische Universität Darmstadt, Darmstadt, Germany; [2]Institute Jožef Stefan, Ljubljana, Slovenia

CJ-4:IL03 **Highly Sensitive and Selective Hydrogen Sensing Utilizing an Interface between Noble Metal and Anodized Titania**
TAKEO HYODO, Y. SHIMIZU, Graduate School of Engineering, Nagasaki University, Nagasaki, Japan

CJ-4:IL04 **Nanostructural Metal Oxide and Chalcogenide Semiconductor Gas Sensors**
CHONG-YUN KANG, Korea Institute of Science and Technology, Seoul, South Korea

CJ-4:IL05 **MEMS Gas Sensors Based on Metal Oxide Nano Particles**
KENGO SHIMANOE[1], W. HARANO[2], T. OHYAMA[2], K. SUEMATSU[1], K. WATANABE[1], M. NISHIBORI[1], [1]Faculty of Engineering Sciences, Kyushu University, Fukuoka, Japan; [2]Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, Kasuga, Fukuoka, Japan

CJ-4:IL06 **Sol-gel Coatings for Sensing Devices and Electronics Applications**
O.A. SHILOVA, Institute of Silicate Chemistry, Russian Academy of Sciences, Saint-Petersburg, Russia

CJ-4:L07 **Narrow Band Gap Observed in Multicomponent Equitatomic Rare Earth Oxides**
L. VELASCO[1], A. SARKAR[1, 2], H. HAHN[1, 2, 3], [1]Institute of Nanotechnology, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany; [2]Joint Research Laboratory Nanomaterials – Technische Universität Darmstadt and Karlsruhe Institute of Technology, Darmstadt, Germany; [3]Helmholtz Institute Ulm – Electrochemical Energy Storage, Ulm, Germany

Session CJ-5
Fast Ion-conducting Ceramics

CJ-5:IL01 **Understanding Irradiation Effect on the Structure and Electrochemical Charge Storage Properties of TiO2 Anode for Lithium-ion Batteries**
K.A. SMITH[1], A.I. SAVVA[1], YONGQIANG WANG[2], J.P. WHARRY[3], SOOYEON HWANG[4], DONG SU[4], D.P. BUTT[5], **HUI XIONG**[1], [1]Micron School of Materials Science and Engineering, Boise State University, Boise, ID, USA; [2]Ion Beam Materials Laboratory, Los Alamos National Laboratory, Los Alamos, NM, USA; [3]School of Nuclear Engineering, Purdue University, West Lafayette, IN, USA; [4]Center for Functional Materials, Brookhaven National Laboratory, Upton, NY, USA; [5]College of Mines and Earth Sciences, University of Utah, Salt Lake City, UT, USA

CJ-5:IL02 **Material Design for an Electrode of an Oxygen Pump Based on Oxide-ion Conductors**
KEN WATANABE, Kyushu University, Kasuga, Japan

CJ-5:IL03 **Electrochemical Membranes in Energy Conversion**
F. MARQUES, Dept. of Materials and Ceramic Eng./CICECO, University of Aveiro, Aveiro, Portugal

CJ-5:L04 **Enhancement of Ionic Conductivity in Electric Field-assisted Pressureless Sintered Solid Electrolytes**
R. MUCCILLO[1, 2], [1]Center of Science and Technology of Materials, Energy and Nuclear Research Institute, S. Paulo, SP, Brazil; [2]Center of Engineering, Modeling and Applied Social Sciences, Federal University of ABC, Santo André, SP, Brazil

CJ-5:L05 **Development and Electrical Discharge Machining of Electrical Conductive Pressure-less Sintered TiC/Al2O3 Composites**
S. CONZE, S. HILDEBRANDT, T. HUTZLER, L.-M. BERGER, A. MICHAELIS, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden, Germany

CJ-5:L06 **Cubic Phase Stabilization and Ionic Conductivity of Zirconia-scandia by Co-doping with Europium Oxide**
J.P. SOUZA, **E.N.S. MUCCILLO**, Energy and Nuclear Research Institute-IPEN, Cidade Universitária S. Paulo, SP, Brazil

CJ-5:L07 **Properties of Shape-controlled Gadolinia-doped Ceria Nanoparticles**
M.F.S. MACHADO, L.P. R. MORAES, L.N. RODRIGUES, T. RODRIGUES, **F. CORAL FONSECA**, Nuclear and Energy Research Institute - IPEN, Sao Paulo, SP, Brazil

CJ-5:IL08 **Interfacial Contributions to Mixed Ionic and Electronic Conducting (MIEC) Materials in Solid Oxide Fuel Cells, Membrane Separations and Solid-State Battery Applications**
K.S. BRINKMAN, Materials Science and Engineering, Clemson University, Clemson, SC, USA

CJ-5:IL09 **Effects of Remnant Metastability in Nanoscaled Oxygen Ionic Conductors**
V. ESPOSITO, Technical University of Denmark, Department of Energy Conversion and Storage, Roskilde, Denmark

CJ-5:IL10 **Design, Synthesis and Electrochemical Characterizations of Electrode Materials for Rechargeable Li-sulfur Batteriess**
DO KYUNG KIM, Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

SYMPOSIUM CK
FUNCTIONAL MAGNETIC OXIDES

Session CK-1
Magnetic Oxide Thin Films Interfaces and Heterostructures

CK-1:IL01 **Engineering the Functional Properties of 2-dimensional Electron Gases at Oxide Interfaces**
F. MILETTO GRANOZIO, CNR-SPIN, Napoli, Italy

CK-1:IL02 **Tuning the Properties of Oxide Heterostructures by Interfacial Oxygen Octahedral Coupling**
G. KOSTER, University of Twente, Enschede, The Netherlands

CK-1:IL03 **Domain Wall Conduction at All-in-all-out Antiferromagnetic Iridate Heterointerface**
MASAKI UCHIDA, University of Tokyo, Tokyo, Japan

CK-1:IL04 **Complex Magnetic Order in Rare-earth Nickel Oxide Multilayers**
E. BENCKISER, Max Planck Institute for Solid State Research, Stuttgart, Germany

CK-1:IL05 **Carrier Density Controlled Topological Hall Effect in EuTiO3 Films**
K. AHADI, **S. STEMMER**, Materials Department, University of California, Santa Barbara, CA, USA

CK-1:L06 **Giant Topological Hall Effect from Magnetic Skyrmion Bubbles in Correlated Manganite Thin Films**
L. VISTOLI, A. SANDER, QIUXIANG ZHU, S.E FUSIL, A. BARTHELEMY, V. GARCIA, M. BIBES, Unité Mixte de Physique CNRS/Thales, Université Paris-Sud, Université Paris-Saclay, Palaiseau, France; WENBO WANG, WEIDA WU, Rutgers Center for Emergent Materials and Department of Physics and Astronomy, Rutgers University, Piscataway, NJ, USA; B. CASALS, R. CICHELERO, G. HERRANZ, Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Campus de la UAB, Bellaterra, Catalonia, Spain

CK-1:L07 **New Electronic States in Iridate Single Crystals and Thin Films**
A. FORGET, **J.-B. MOUSSY**, D. COLSON, SPEC, CEA-Saclay, Gif-sur Yvette, France; Z.Z. LI, V. BROUET, LPS, Université Paris-Sud, Orsay, France

Session CK-2
Spin Transport in Magnetic Oxides

CK-2:IL01 **Spin/Charge Interconversion in Oxide Two-dimensional Electron Gases**
M. BIBES, **F. TRIER**, Unité Mixte de Physique CNRS/Thales, Palaiseau, France

CK-2:IL02 **Transport Phenomena in Heterostructures of Strong Spin-orbit Interaction Oxides**
JOBU MATSUNO, RIKEN Center for Emergent Matter Science (CEMS), Saitama, Japan

CK-2:IL03 **Spin Seebeck Effects in Magnetic-oxide-based Multilayers**
R. RAMOS, Advanced Institute for Materials Research, Tohoku University, Sendai, Japan; T. KIKKAWA, Advanced Institute for Materials Research and Institute for Materials Research, Tohoku University, Sendai, Japan; A. ANADON, I. LUCAS, Fundacion Instituto de Nanociencia de Aragon and Departamento de Fisica de la Materia Condensada, Universidad de Zaragoza, Zaragoza, Spain; R. IGUCHI, National Institute for Materials Science, Tsukuba, Japan; S. DAIMON, Advanced Institute for Materials Research and Institute for Materials Research, Tohoku University, Sendai, Japan; K. UCHIDA, National Institute for Materials Science, Tsukuba and PRESTO, Japan Science and Technology Agency, Saitama, Japan; H. ADACHI, Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan; P.A. ALGARABEL, Departamento de Fisica de la Materia Condensada and Instituto de Ciencia de Materiales de Aragon, Universidad de Zaragoza and Consejo Superior de Investigaciones Cientificas, Zaragoza, Spain; L. MORELLON, Fundacion Instituto de Nanociencia de Aragon and Departamento de Fisica de la Materia Condensada, Universidad de Zaragoza, Zaragoza, Spain; M.H. AGUIRRE, Fundacion Instituto de Nanociencia de Aragon and Departamento de Fisica de la Materia Condensada and Laboratorio de Microscopias Avanzadas, Universidad de Zaragoza, Zaragoza, Spain; S. MAEKAWA, Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan; M.R. IBARRA, Fundacion Instituto de Nanociencia de Aragon and Departamento de Fisica de la Materia Condensada and Laboratorio de Microscopias Avanzadas, Universidad de Zaragoza, Zaragoza, Spain; E. SAITOH, Advanced Institute for Materials Research and Institute for Materials Research and Center for Spintronics Research Network, Tohoku University, Sendai and Advanced Science Research Center, Japan Atomic Energy Agency, Tokai, Japan

Session CK-3
Electronic Structure and Correlation Effects

CK-3:IL01 **Correlated Electronic Structure of Oxide Heterostructures**
F. LECHERMANN, Institut für Theoretische Physik, Universität Hamburg, Hamburg, Germany

CK-3:IL02 **Charge Transfer Effects in Rare Earth Nickelates**
J. VARIGNON[1], M.N. GRISOLIA[1], J. INIGUEZ[2], A. BARTHELEMY[1], M. BIBES[1], [1]Unité Mixte de Physique, CNRS, Thales, Université Paris Sud, Université Paris-Saclay, Palaiseau, France; [2]Materials Research and Technology Department, Luxembourg Institue of Science and Technology (LIST), Esch/Alzette, Luxemburg

CK-3:IL03 **Emergent Quantum Phases in Relativistic Magnetic Oxides**
C. FRANCHINI, University of Vienna, Vienna, Austria

CK-3:IL04 **High Pressure Synthesis of Oxides and Mixed-anion Oxides with Novel Magnetic and Transport Properties**
HIROSHI KAGEYAMA, Kyoto University, Kyoto, Japan

Session CK-4
Interplay Between Spin, Charge and Lattice Degrees of Freedom

CK-4:IL01 **Unconventional Metals from Doped Spin-orbit Assisted Mott States**
S.D. WILSON, University of California at Santa Barbara, Santa Barbara, CA, USA

CK-4:L02 **Magnon Study in (Y, Lu)MnO3 System using Raman Spectroscopy**
SEUNG KIM[1], JIYEON NAM[1], THI HUYEN NGUYEN[1], IN-SANG YANG[1], XUEYUN WANG[2], SANG-WOOK CHEONG[2], [1]Department of Physics, Ewha Womans University, Seoul, South Korea; [2]Rutgers Center for Emergent Materials and Department of Physics and Astronomy, Rutgers University, Piscataway, NJ, USA

Session CK-5
Multiferroic and Magnetoelectric Compounds

CK-5:IL01 **Marrying Ferroelectricity and Metallicity: "It's Complicated"**
V. FIORENTINI, A. FILIPPETTI, Cagliari University, Monserrato (CA), Italy; F. RICCI, Louvain University, Belgium; A. URRU, P. DELUGAS, SISSA, Trieste, Italy; J. INIGUEZ, H.J. ZHAO, LIST, Luxembourg; E. CANADELL, ICMAB, Spain; L. BELLAICHE, University of Arkansas, USA

CK-5:L02 **Nonlinear Spin-lattice Coupling in EuTiO3: Novel Two-dimensional Magneto-optical Device for Light Modulation**
A. BUSSMANN-HOLDER[1], J. KOHLER[1], K. ROLEDER[2], [1]Max-Planck-Institute for Solid State Research, Stuttgart, Germany; [2]Institute of Physics, University of Silesia, Katowice, Poland

CK-5:L03 **Nanopillars with E-field Accessible Multi-state (N≥4) Magnetization with Giant Magnetization Changes in Self-assembled BiFeO3-CoFe2O4/Pb(Mg1/3Nb2/3)-38at%PbTiO3 Heterostructures**
XIAO TANG, JIEFANG LI, **D. VIEHLAND**, Dept. of Materials Science and Engineering, Virginia Tech, Blacksburg, VA, USA

CK-5:L04 **Observation of Metamagnetic Transition and Magnetoelectric Coupling in Acentric and Non-polar Pb2MnO4**
K.D. CHANDRASEKHAR[1], H.C. WU[1], D.J. HSIEH[1], B.J. SONG[1], J.-Y. LIN[2], J.L. HER[3], **HUNG-DUEN YANG**[1], [1]Department of Physics, National Sun Yat-sen University, Kaohsiung, Taiwan; [2]Institute of Physics, National Chiao Tung University, Hsinchu, Taiwan; [3]Division of Natural Science, Center for General Education, Chang Gung University, Tao-Yuan, Taiwan

CK-5:L05 **Origin of High Magnetoelectric Coupling in Multiferroic BiFeO3-BaTiO3 Superlattices**
M. LORENZ[1], V. LAZENKA[2], C. PATZIG[3], S. SELLE[3], D. HIRSCH[4], T. HÖCHE[3], K. TEMST[2], M. GRUNDMANN[1], [1]Universität Leipzig, Felix-Bloch-Institut für Festkörperphysik, Semiconductor Physics Group, Leipzig, Germany; [2]KU Leuven, Instituut voor Kern- en Stralingsfysica, Leuven, Belgium; [3]Fraunhofer-Institut für Mikrostruktur von Werkstoffen und Systemen, Center for Applied Microstructure Diagnostics, Halle, Germany; [4]Leibniz-Institut für Oberflächenmodifizierung e.V., Physikalische Abteilung, Leipzig, Germany

CK-5:L06 **Crystal and Magnetic Structure of Bi1-xLaxFe1-yMnyO3 Ceramics**
D.V. KARPINSKY[1, 2], I.O. TROYANCHUK[1, 2], M.V. SILIBIN[1], V.A. KHOMCHENKO[3], [1]National Research University of Electronic Technology "MIET", Zelenograd, Moscow, Russia; [2]Scientific-Practical Materials Research Centre of NAS of Belarus, Minsk, Belarus; [3]CFisUC, Department of Physics, University of Coimbra, Coimbra, Portugal

Session CK-6

Coexistence of Superconductivity and Magnetism

CK-6:IL01 **Superconducting Properties of Ultrathin FeSe Films on Oxide Substrates**
TSUTOMU NOJIMA, J. SHIOGAI, T. MIYAKAWA, Y. ITO, T. HARADA, A. TSUKAZAKI, Institute for Materials Research, Tohoku University, Sendai, Japan

CK-6:IL02 **Novel Proximity Phenomena at High Tc Superconductor Interfaces**
D. SANCHEZ-MANZANO[1], M. ROCCI[1], F.A. CUELLAR[1], M. VARELA[1], Z. SEFRIOUI[1], C. LEON[1], J. TRASTOY[2], X. PALERMO[2], V. ROUCO[2], J. VILLEGAS[2], M. GARCIA HERNANDEZ[3], Q. WANG[4], Y.H. LIU[4], S.G.E. TE VELTHUIS[4], M.R. FITZSIMMONS[5], **J. SANTAMARIA**[1], [1]GFMC, Depto. Física de Materiales, Universidad Complutense de Madrid, Madrid, Spain; [2]Unité Mixte de Physique CNRS/Thales, Campus de Polytechnique, Palaiseau and Université Paris-Sud, Orsay, France; [3]Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), Cantoblanco. Madrid, Spain; [4]Materials Science Division, Argonne National Laboratory, Argonne, IL, USA; [5]Oak Ridge National Laboratory, Oak Ridge,TN, USA

CK-6:IL03 **Helical Magnetic Order and Pressure Induced Superconductivity in Binary Pnictides CrAs and MnP**
R. KHASANOV, A. AMATO, P.K. BISWAS, P. BONFA', I. EREMIN, Z. GUGUCHIA, H. LUETKENS, E. MORENZONI, R. DE RENZI, CH. RÜEGG, A.S. SEFAT, M.A. SUSNER, N.D. ZHIGADLO, Laboratory for Muon Spin Spectroscopy, Paul Scherrer Institut, Villigen, Switzerland

Session CK-7

Amorphous, Nano-crystalline Materials and Granular Materials

CK-7:IL01 **Transparent Diluted Magnetic and Plasmonic Metal Oxide Nanocrystals**
P.V. RADOVANOVIC, Department of Chemistry, University of Waterloo, Waterloo, ON, Canada

Session CK-8

Novel Synthesis and Characterization Techniques

CK-8:IL01 **Imaging Magnetic Field at the Nanoscale with a Single Spin Microscope**
V. JACQUES, Laboratoire Charles Coulomb, Université de Montpellier and CNRS, UMR 5221, Montpellier, France

CK-8:IL02 **Atomic-scale Characterization of Charge Distributions at Oxide Interfaces and Néel-Type Domain Walls Using Scanning Transmission Electron Microscopy**
MING-WEN CHU, National Taiwan University, Taipei, Taiwan

CK-5:L03 **Microstructural Evaluation of Magnetite Nanoparticles (Fe3O4) Synthesized by Different Routes**
A. FERREIRA[1, 3], L.B. SALVIANO[2], T.M.S. CARDOSO[1], G.C. SILVA[3], [1]Department of Chemistry, Centro Federal de Educação Tecnológica de Minas Gerais (CEFET-MG), Belo Horizonte, MG, Brazil; [2]Department of Materials Engineering, Centro Federal de Educação Tecnológica de Minas Gerais (CEFET-MG), Belo Horizonte, MG, Brazil; [3]National Institute of Science and Technology on Mineral Resources, Water and Biodiversity (INCT-Acqua), Brazil

Session CK-9

Applications in Electronics and Energy

CK-9:IL01 **Energy Efficiency in Electrocaloric Heat Exchangers**
E. DEFAY, R. FAYE, S. NICOLAU, D. SETTE, H. STROZYK, Luxembourg Institute of Science and Technology, Belvaux, Luxembourg

CK-9:IL02 **Magnetoelectric Multilevel Non-volatile Memory Devices**
YOUNG SUN, DASHAN SHANG, YISHENG CHAI, JIANXIN SHEN, PEIPEI LU, Institute of Physics, CAS, Beijing, China

CK-5:IL03 **Purely Antiferromagnetic Magnetoelectric Random Access Memory (AF-MERAM)**
T. KOSUB, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany

SYMPOSIUM CL

INORGANIC MATERIALS SYSTEMS FOR ADVANCED PHOTONICS

Session CL-1

Photonic Nanomaterials and Nanostructures

CL-1:IL01 **Synthesis of Nanoparticles: the Role of Chemical Parameters Toward Functional Materials**
A. LAURIA, Laboratory for Multifunctional Materials, Swiss Federal Institute of Technology (ETH-Zurich), Zürich, Switzerland

CL-1:IL02 **Yb3+ Photoluminescence Enhancement by Disordered Plasmonic Networks Assembled on Anisotropic Crystals**
L. SANCHEZ-GARCIA, M.O, RAMIREZ, **L.E. BAUSA**, Dept. Fisica de Materiales, Universidad Autónoma de Madrid, Madrid, Spain; J.J. CARVAJAL, R. SOLE, M. AGUILO, F. DIAZ, Fisica i Cristal·lografia de Materials i Nanomaterials, Universitat Rovira i Virgili, Tarragona, Spain

CL-1:IL03 **Tuning Plasmonic and Photonic Properties in Mesoporous Nanocomposite Materials**
G.J.A.A. SOLER-ILLIA, Instituto de Nanosistemas, Universidad Nacional de General San Martín, San Martín, Buenos Aires, Argentina

CL-1:IL04 **Colloidal Nanocrystals: Functional Materials for Photonic Applications**
M. STRICCOLI[1], E. FANIZZA[2, 1], A. PANNIELLO[1], N. DEPALO[1], M. CORRICELLI[1], C. INGROSSO[1], R. COMPARELLI[1], A. AGOSTIANO[2, 1], M. L. CURRI[1], [1]CNR IPCF Bari c/o Chem. Dept., University of Bari, Bari, Italy; [2]Chemistry Dept., University of Bari, Bari, Italy

CL-1:IL05 **Integrated Lithium Niobate Photonics**
M.A. BAGHBAN, K. GALLO, Department of Applied Physics, KTH-Royal Institute of Technology, Stockholm, Sweden

Session CL-2

Luminescent and Chromogenic Ceramics and Glass Systems

CL-2:IL01 **Ceramic Phosphor Development for Solid State Lighting (SSL)**
I. KINSKI, M. ARNOLD, Fraunhofer Institute for Ceramic Technologies and Systems, Hermsdorf, Germany; M. FRIES, U. PARTSCH, Fraunhofer Institute for Ceramic Technologies and Systems, Dresden, Germany

CL-2:IL02 **Rare-earth-doped Glass and Glass-ceramic Phosphors for Radiation Imaging and Dosimetry**
GO OKADA[1], F. CHICILO[2], JUMPEI UEDA[3], S. TANABE[3], A. EDGAR[4], G. BELEV[2], T. WYSOKINSKI[5], D. CHAPMAN[2], T. YANAGIDA[1], S. KASAP[2], [1]Nara Institute of Science and Technology, Nara, Japan; [2]University of Saskatchewan, Canada; [3]Kyoto University, Japan; [4]Victoria University of Wellington, New Zealand; [5]Canadian Light Source, Canada

CL-2:IL03 **GGAG Nanoceramics Doped with Rare Earth for Application in LED Lighting**
P. GLUCHOWSKI, W. STREK, W. RYBA-ROMANOWSKI, P. SOLARZ, Institute of Low Temperature and Structure Research PAS, Wrocław, Poland

CL-2:IL04 **Optical, Luminescent and Mechanical Properties of SPSed Ceramics Based on YSZ and MgAl2O4**
E.S. DVILIS, **O.L. KHASANOV**, E.F. POLISADOVA, V.D. PAYGIN, Tomsk Polytechnic University, Tomsk, Russia

CL-2:IL05 **Theoretical Modeling of Optical Properties of Red Phosphors for White LEDs**
M.G. BRIK, College of Sciences, Chongqing University of Posts and Telecommunications, Chongqing, P.R. China; Institute of Physics, University of Tartu, Tartu, Estonia; Institute of Physics, Jan Długosz University, Czestochowa, Poland

CL-2:L06 **Morfological, Photoluminescent and Structural Properties Study of Pr3+-Doped α-Ag2WO4 Synthesized by the Coprecipitation Methodology**
I.L.V. ROSA[1], C.L. CORREA[1], I.M. PINATTI[1], R. ROMANCINI[1], E. LONGO[1,2], [1]CDMF, LIEC, Chem. Depart., Federal University of São Carlos (UFSCar), São Carlos, Brazil; [2]CDMF, LIEC, São Paulo State University (UNESP), Araraquara, Brazil

Session CL-3
Transparent Conducting and Non-conducting Ceramics

CL-3:IL01 **Rare Earth Ion Doped Transparent Ceramics with Long Optical Coherence Lifetime**
HAITAO ZHANG, J. YANG, S. GRAY, J.A. BROWN, T.D. KETCHAM, D.E. BAKER, A. CARAPELLA, R.W. DAVIS, J.G. ARROYO, D.A. NOLAN, Corning Research & Development Corp., Sullivan Park, Corning, NY, USA

CL-3:IL02 **Chalcogenide Glass-ceramics Transparent in the Infrared**
L. CALVEZ, Glass and ceramic team UMR-CNRS 6226, Institute of Chemical Sciences of Rennes, Université de Rennes 1, Rennes, France

CL-3:IL03 **Transparent Ceramics Based on Rare Earth Ions-doped Cubic Tungstate/Molybdate Matrices: A Challenge and Prospect for New Efficient Optical Materials?**
M. GUZIK[1], M. BIEZA[1], E. TOMASZEWICZ[2], Y. GUYOT[3], G. BOULON[3], [1]Faculty of Chemistry, University of Wrocław, Wrocław, Poland; [2]Department of Inorganic and Analytical Chemistry, West Pomeranian University of Technology, Szczecin, Poland; [3]Univ Lyon, Université Claude Bernard Lyon1, CNRS, Institut Lumière Matière, Villeurbanne, France

CL-3:L04 **Spark Plasma Sintering (SPS) of Alumina-based Transparent Ceramics**
A. PILLE[1], A. KANAEV[1], T. BILLETON[2], E. FELDBACH[3], F. SCHOENSTEIN[1], [1]Laboratoire de Sciences des Procédés et des Materiaux, CNRS UPR-3407, Université Paris 13, Sorbonne Paris Cité, Villetaneuse, France; [2]Laboratoire de Physique des Lasers, CNRS UMR-7538, Université Paris 13, Sorbonne Paris Cité, Villetaneuse, France; [3]Institute of Physics, University of Tartu, Tartu, Estonia

Session CL-4
Laser Materials

CL-4:IL01 **Optical Ceramics for High Energy Lasers**
J. SANGHERA[1], W. KIM[1], G. VILLALOBOS[1], S. BAYYA[1], C. BAKER[1], M. HUNT[1], B. SHAW[1], J. FRANTZ[1], B. SADOWSKI[2], R, MIKLOS[2], L. BUSSE[1], D. BOYD[1], I. AGGARWAL[2], C. ASKINS[1], J. MYERS[1], J. PEELE[2], D. RHONEHOUSE[1], R. THAPA[2], S. BOWMAN[1], [1]Naval Research Laboratory, Optical Science Division, Washington, DC, USA; [2]Sotera Defense Solutions, Herndon, VA, USA

CL-4:IL02 **Yb :CaF2 Laser Ceramics: Synthesis and Physical Characterizations**
M. MORTIER, J. SARTHOU, P. GREDIN, Institut de Recherche de Chimie Paris, CNRS - Chimie ParisTech, PSL Research University France; F. DRUON, J. HOSTALRICH, P. GEORGES, Laboratoire Charles Fabry, UMR 8501, Institut d'Optique, CNRS, Univ. Paris Sud, Palaiseau, France

CL-4:L03 **Holmium Doped Yttria Transparent Ceramics for 2-μm Solid State Lasers**
JUN WANG[1,2], YONGGUANG ZHAO[1], DANLEI YIN[2,3], PENG LIU[1], JIE MA[1,2], YING WANG [1,3], DEYUAN SHEN[1], ZILI DONG[3], LING BING KONG[3], DINGYUAN TANG[1], [1]Jiangsu Key Laboratory of Advanced Laser Materials and Devices, School of Physics and Electronic Engineering, Jiangsu Normal University, Xuzhou, China; [2]School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore; [3]School of Materials Science and Engineering, Nanyang Technological University, Singapore

CL-4:IL04 **Vision for Advanced Laser Materials**
J. BALLATO, M. CAVILLON, P.D. DRAGIC, Clemson University, Clemson, SC, USA; University of Illinois at Urbana-Champaign, Urbana, IL, USA

CL-4:IL05 **Mid-infrared Transition Metal Doped Chalcogenide Laser Materials and Lasers**
S.B. MIROV[1,2], I.S. MOSKALEV[2], M.S. MIROV[2], S. VASILYEV[2], V.V. FEDOROV[1,2], D.V. MARTYSHKIN[1,2], O. GAFAROV[1], V. SMOLSKI[2], [1]Center for Optical Sensors and Spectroscopies and the Department of Physics, University of Alabama at Birmingham, CH 310, Birmingham, AL, USA; [2]IPG Photonics Corporation, Southeast Technology Center, Birmingham, AL, USA

CL-4:L06 **Recent Progress on Fabrication of Rare-earth Doped Sesquioxide Laser Ceramics**
J. WANG[1,2], D.L. YIN[1], P. LIU[2], J. MA[1,2], Z.L. DONG[3], L.B. KONG[3], **DINGYUAN TANG**[1,2], [1]School of Electrical and Electronic Engineering, Nanyang Technogical University, Singapore; [2]Jiangsu Key Laboratory of Advanced Laser Materials and Devices, Jiangsu Normal University, China; [3]School of Materials Science and Engineering, Nanyang Technological University, Singapore

CL-4:L07 **Nd3+-doped Lu2O3 Laser Materials as Ceramics (SPS, HIP) and Single Crystals (μ-Pulling Down). Spectroscopic Properties and Comparison of Laser Outputs**
G. BOULON, G. ALOMBERT-GOGET, Y. GUYOT, Institute Light Matter, UMR5306 CNRS, UCBLyon1, University of Lyon, Villeurbanne, France; M. GUZIK, Faculty of Chemistry, University of Wrocław, Poland; J. PEJCHAL, A. YOSHIKAWA, A. ITO, T. GOTO, Institute for Materials Research,Tohoku University, Sendai, Japan; A. IKESUE, World Lab. Co., Ltd., Nagoya, Japan; G. TOCI, National Institute of Optics, NRC, INO-CNR, Sesto Fiorentino, Italy

CL-4:L08 **Effect of Gd3+ on Yb3+ Emission in Gd Admixed Yb:YAG at Cryogenic Temperature**
S.P. DAVID, V. JAMBUNATHAN, F. YUE, P. NAVRATIL, M. MIKA; A. LUCIANETTI, T. MOCEK, HiLASE Centre, Institute of Physics CAS, Dolní Brežany, Czech Republic; Department of Glass and Ceramics, University of Chemistry and Technology, Prague, Prague, Czech Republic

Session CL-5
Inorganic Optical Fibers

CL-5:IL01 **Optical Fiber Materials and Process Innovations for Next Generation Telecommunication Systems**
P. TANDON, Corning Inc., Corning, NY, USA

CL-5:IL02 **Shining a Light on Disease with Mid-infrared Fibreoptics**
A.B. SEDDON, Ł. SOJKA, T.M. BENSON, D. FURNISS, Z.Q. TANG, H. PARNELL, D. JAYASURIYA, Y. FANG, M. SHEN, S. SUJECKI, Mid-Infrared Photonics Group, George Green Institute for Electromagnetics Research, University of Nottingham, Nottingham, UK

CL-5:IL03 **Telluride and Fluoride Glass Fiber Lasers for UV to Mid-IR**
N. PEYGHAMBARIAN, University of Arizona, Tucson, AZ, USA

CL-5:IL04 **Composite Material Optical Fibres - Functionalisation with Semiconductors and 2D Materials**
P.J.A. SAZIO, A. LEWIS, F. DE LUCIA, W. BELARDI, F. POLETTI, C.C. HUANG, D. HEWAK, ORC, University of Southampton, UK; V. GOPALAN, J.V. BADDING, Dept. of Chemistry and Materials Research Institute, Pennsylvania State University, State College, PA, USA

Session CL-6
Photons Management

CL-6:IL01 **Whispering Gallery Mode Resonator Based Sensors**
T. IOPPOLO, Southern Methodist University, Dallas, TX, USA

CL-6:IL02 **Rare Earth Microcavity Lasers for Silicon Nanophotonics**
J.D.B. BRADLEY, McMaster University, Hamilton, Ontario, Canada

CL-6:IL03 **Efficient Frequency Conversion in PhoXonic Cavities Based on Whispering Gallery Mode Resonators**
D. FARNESI, G. RIGHINI, G. NUNZI CONTI, **S. SORIA**, CNR-IFAC, Institute of Applied Physics "N. Carrara", Sesto Fiorentino, Italy

Session CL-7
Advances in Characterization Techniques

CL-7:IL01 **New Directions in Materials Characterization with Hard x-ray Photoemission**
C.S. FADLEY, Department of Physics, University of California Davis and Materials Sciences Division, Lawrence Berkeley National Laboratory, Davis, CA, USA

CL-7:IL02 **New Spectroscopic Tools for the Investigation of Energy Transfer Dynamics: Coherent Multidimensional Techniques**
E. COLLINI, Dipartimento di Scienze Chimiche, Università di Padova, Padova, Italy

CL-7:IL03 **The Role of Computations in Complex Optical Problems**
L. RAMUNNO, A. CALÀ LESINA, P. BERINI, University of Ottawa, Ottawa ON, Canada

CL-7:L04 **Ultrafast Scanning Electron Microscopy (USEM) to Probe Charge Dynamics in Oxide Thin Films**
S.M. PIETRALUNGA[1, 2], V. SALA[2, 3], G. CERULLO[1, 3], G. LANZANI[2, 3], G. IRDE[2,3], M. ZANI[3], A. TAGLIAFERRI[2, 3], 1CNR-IFN, Milano, Italy; [2]CNST@ Polimi, IIT, Milano, Italy; [3]Department of Physics, Politecnico di Milano, Milano, Italy

Session CL-8
Ongoing Applications and Forecasts

CL-8:IL01 **Transparent Ceramics: Materials, Engineering Progress and Applications**
A.E. GOLDSTEIN, Israel Ceramics and Silicates Institute, Haifa, Israel

CL-8:IL02 **Progress in Transparent Ceramic Development and its Laser Applications**
M. DUBINSKII, US Army Research Laboratory, Adelphi, MD, USA

CL-8:IL03 **Additive Manufacturing of Ceramic and Glass Materials for Photonics Applications**
SHUO LI[1], RAN ZOU[1], MOHAN WANG[1], SHENG HUANG[1], MING-JUN LI[2], M. BURIC[3], P. OHODNICKIC[3], **KEVIN P. CHEN**[1], [1]Department of Electrical and Computer Engineering, University of Pittsburgh, Pittsburgh, PA, USA; [2]Corning Incorporated, Corning, NY, USA; [3]National Energy Technology Laboratory, Pittsburgh, PA, USA

CL-3:L04 **Glass and Glass-ceramic of Silica-calcia System Doped with Eu3+ Ions**
A. LUKOWIAK, M. PTAK, A. HOJENSKA, W. STREK, Institute of Low Temperature and Structure Research, PAS, Wroclaw, Poland; J. KRZAK, B. BABIARCZUK, B. BORAK, Department of Mechanics, Materials Science and Engineering, Wroclaw University of Science and Technology, Wroclaw, Poland

SYMPOSIUM CM
SCIENCE AND TECHNOLOGY FOR SILICATE CERAMICS

Session CM-1
Smart Silicate Ceramics

CM-1:IL01 **Functionalised Exposed Building Materials**
D.M. TOBALDI[1], L. GRAZIANI[2], B FIGUEIREDO[3], M.N. CAPELA[1], R. SILVA[3], L. HENNETIER[4], V ABRANTES[3], P. FERREIRA[5], M.P. SEABRA[1], E. QUAGLIARINI[2], J.A. LABRINCHA[1], [1]Department of Materials and Ceramics Engineering/CICECO - Aveiro Institute of Materials, University of Aveiro, Campus Universitário de Santiago, Aveiro, Portugal; [2]Polytechnic University of Marche, Department of Civil and Building Engineering and Architecture, Ancona, Italy; [3]Graphenest, S.A., Lugar da Estação, Edificio Vouga Park, Paradela do Vouga, Portugal; [4]Technological Center for Ceramic and Glass Industries, CTCV, Coimbra, Portugal; [5]RECER, Indústria de Revestimentos Cerâmicos, S.A., Oliveira do Bairro, Portugal

CM-1:IL02 **Energy Efficient Manufacturing of Ceramic Wall Tiles With and Without Functionality**
F. KARA, Department of Materials Science and Engineering, Anadolu University, Eskisehir, Turkey

CM-1:IL03 **Enhancing Silicate Ceramics with Photocatalytic Activity**
A. SEVER SKAPIN, E. ŠVARA FABJAN, N. ROZMAN, L. ŠKRLEP, P. NADRAH, National Building and Civil Engineering Institute of Slovenia, Ljubljana, Slovenia

CM-1:IL04 **Effect of Firing Temperature on the Photocatalytic Activity of Ceramic Glazes**
M. SCARPATO, **A.M. BERNARDIN**, Ceramic Materials Group, UNESC, Criciúma, Santa Catarina, Brazil

CM-1:IL05 **Development and Characterization of Multifunctional Coatings: Scratch Resistant Superhydrophobic Surfaces**
R. TAURINO, F. BONDIOLI, Dipartimento di Ingegneria e Architettura, Università di Parma, Parma, Italy; M. MESSORI, M. CANNIO, Dipartimento di Ingegneria Enzo Ferrari, Università di Modena e Reggio Emilia, Modena, Italy; D.R. BOCCACCINI, G. MORINI, Tecnoitalia, Sassuolo, Italy

CM-1:IL06 **Transparent Titania-based Thin Films with Silicate Binder for Self-cleaning and Photocatalytic Applications**
U. LAVRENVIC STANGAR[1, 2], N. VODIŠEK[2], A. ŠULIGOJ[1, 3], [1]University of Ljubljana, Faculty of Chemistry and Chemical Technology, Ljubljana, Slovenia; [2]University of Nova Gorica, Nova Gorica, Slovenia; [3]National Institute of Chemistry, Ljubljana, Slovenia

CM-1:L07 **Eco-friendly Self-cooling System of Porous Silicate Plates by Evaporation of Absorbed Water**
HIROAKI KATSUKI, EUN-KYOUNG CHOI, WON-JUN LEE, UNG-SOO KIM, KWANG-TAEK HWANG, WOO-SEOK CHO, SRIDHAR KOMARNENI, Korea Institute of Ceramic Engineering & Technology; The Pennsylvania State University, USA

Session CM-2
Green Silicate Ceramics

CM-2:IL01 **Valorization of Industrial Wastes in Green Ceramic Products**
RUI M. NOVAIS, L. BURUBERRI, J. CARVALHEIRAS, J. CARNEIRO, M. SAELI, M.P. SEABRA, **J.A. LABRINCHA**, Department of Materials and Ceramic Engineering / CICECO-Aveiro Institute of Materials, University of Aveiro, Campus Universitário de Santiago, Aveiro, Portugal

CM-2:IL02 **Porcelain Stoneware Tiles Above and Beyond Innovation: a Break with Tradition**
E. RAMBALDI, Centro Ceramico, Bologna, Italy

CM-2:IL03 **Synthesizing Building Ceramics with High Crystallinity and Improved Properties from High Amounts of Industrial Wastes**
A. KARAMANOV, E. KARAMANOVA, G. AVDEEV, S. ATANASOVA-VLADIMIROVA, Institute of Physical Chemistry "Acad. Rostislaw Kaishew", Bulgarian Academy of Sciences, Sofia, Bulgaria

CM-2:IL04 **Waste Recycling in Clay Bricks**
C.M.F. VIEIRA[1], L. FONSECA AMARAL[1], S.N. MONTEIRO[2], [1]State University of the Northern Rio de Janeiro, UENF, Advanced Materials Laboratory, LAMAV, Campos dos Goytacazes, RJ, Brazil; [2]Military Institute of Engineering, IME, Department of Materials Science, Praia Vermelha, Urca, RJ, Rio de Janeiro, RJ, Brazil

CM-2:L05 **Technical Feasibility of Using Electric Arc Furnace Slag in Manufacturing of Bricks**
A.A. GUZMAN, N.C. TORRES, Escuela Colombiana de Ingeniería Julio Garavito, Bogotá, Colombia

CM-2:L06 **Sustainable Construction Materials: Renewable Synthesis of Glass and Glass-ceramics Using Sugarcane Bagasse Ash (SCBA) as Main Raw Material**
J.A. PEREZ-CASAS[1], C. MUGONI[2], C. SILIGARDI[2], A.A. ZALDIVAR-CADENA[1], E.I. CEDILLO-GONZÁLEZ[1], J.J. RUIZ-VALDÉS[1], A.I. SÁNCHEZ-VÁZQUEZ[1], [1]Universidad Autónoma de Nuevo León, Facultad de Ciencias Químicas, San Nicolás de los Garza, N.L., Mexico; [2]Università Degli Studi di Modena e Reggio Emilia, Dipartimento di Ingegneria "Enzo Ferrari", Modena, Italy

CM-2:IL07 **Green Silicate Ceramics Based on Agro-residues**
L. BARBIERI[2], F. ANDREOLA[1], R.D. FARIAS[2], C. MARTÍNEZ GARCÍA[2], I. LANCELLOTTI[1], T. COTES PALOMINO[2], [1]Department of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia, Modena, Italy; [2]Department of Chemical, Environmental and Material Engineering, High Polytechnic School of Linares, University of Jaen, Linares Scientific and Technological Campus, Linares, Spain

CM-2:L08 **High-content Waste-based Bodies for Porcelain Stoneware Tiles: Technological Profiling**
R. SOLDATI, C. ZANELLI, G. GUARINI, M. DONDI, CNR-ISTEC, Faenza, Italy; E. RAMBALDI, M.C. BIGNOZZI, Centro Ceramico, Bologna, Italy

CM-2:L09 **Technical Feasibility of Using Cigarettes Butts in Manufacturing of Bricks (LADRICOL)**
K.M. CORREDOR, A.A. GUZMÁN, N.C TORRES, Escuela Colombiana de Ingeniería Julio Gravito, Bogotá, Colombia

Session CM-3
Coating and Decoration of Silicate Ceramics

CM-3:IL01 **Viscous Flow Sintering in Ceramic Glaze and Body Compositions**
J.L. AMOROS, A. MORENO, E. BLASCO, Instituto de Tecnología Cerámica (ITC). Asociación de Investigación de las Industrias Cerámicas (AICE),Universitat Jaume I, Castellón, Spain

CM-3:IL02 **Influence of Printing Parameters on Optical Properties of Ink-jet Ceramic Decoration**
C. FERRARI, C. SILIGARDI, Department of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia, Modena, Italy

CM-3:IL03 **Novel Steatite Coatings for Silicate Ceramics: Preparation and Sintering of the Steatite Powders**
A. TERZIC, Institute for Materials Testing IMS, Belgrade, Serbia

CM-3:IL04 **Improvement of Colour Quality and Reduction of Defects in the Ink jet-printing Technology for Ceramic Tiles Production: A Design of Experiments Study**
M. MONTORSI, Department of Science and Methods for Engineering, University of Modena and Reggio Emilia, Reggio Emilia, Italy

CM-3:L05 **Impact of Alkali Metal Oxygens on Structure and Properties of Ceramic Glazes**
J. PARTYKA, K. PASIUT, M. LESNIAK, M. BUCKO, AGH University of Science and Technology, Krakow, Poland

Session CM-4
Innovative Processing in Silicate Ceramics

CM-4:IL01 **Chemical Tempering of Porcelain Tiles**
D. HOTZA[1], M. DAL BO[2], [1]Department of Chemical Engineering (EQA), Federal University of Santa Catarina (UFSC), Florianópolis, SC, Brazil; [2]Federal Institute of Education, Science and Technology of Santa Catarina (IFSC), Campus Criciúma, Criciúma, SC, Brazil

CM-4:IL02 **Varying the Firing Regime of Naturally Occurring Clays Using Thermal Analysis**
M.V. VASIC, Institute for Testing of Materials IMS, Belgrade, Serbia; J.D. ZDRAVKOVIĆ, Innovation Centre - Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Serbia; L.L. PEZO, University of Belgrade, Institute of General and Physical Chemistry, Belgrade, Serbia; P.J. VULIC, Faculty of Mining and Geology, University of Belgrade, Belgrade, Serbia; Z. RADOJEVIC, Institute for Testing of Materials IMS, Belgrade, Serbia

CM-4:IL03 **Advantages of the MW Sintering in Ceramics**
C. LEONELLI, R. ROSA, P. VERONESI, Department of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia, Modena, Italy

CM-4:IL04 **Traditional Raw Materials as Active Components in Biocleaning Desalination Processes**
S. VUCETIC[1], **J. RANOGAJEC**[1], H. HIRSENBERGER[2], A. VIDAKOVIC[1], S. MARKOV[1], [1]University of Novi Sad, Faculty of Technology, Novi Sad, Serbia; [2]University of Novi Sad, Faculty of Techical Science, Novi Sad, Serbia

CM-4:IL05 **Study of the Thermal Behavior and VOC Emission of Digital Inks and Glazes for Ceramic Tiles**
P. ZANNINI, G. FERRARI, University of Modena and Reggio Emilia, Chemical and Geological Science Department, Modena, Italy

CM-4:IL06 **New Advances on Functional Porcelain Technology**
NOBUAKI KAMOCHI, K. NISHIYAMA, H. KATSUKI, Saga Ceramics Research Laboratory, Arita-machi, Saga, Japan

CM-4:L07 **Densification of Porcelain Stoneware Tiles: A Simplified Model Based on Technological Properties**
C. ZANELLI, S. CONTE, R. SOLDATI, M. DONDI, CNR-ISTEC, Faenza, Italy

CM-4:L08 **Phase Transformations and Related Liquid Phase Physical Properties: Evolution During the Viscous Flow Sintering in Porcelain Stoneware Tiles**
S. CONTE[1], C. ZANELLI[1], M. ADIT[2], G. CRUCIANI[2], M. DONDI[1], [1]CNR-ISTEC, Faenza Italy; [2]Department of Physics and Earth Sciences, University of Ferrara, Italy

CM-4:L09 **The Valorization of Phosphogypsum in the Development of New Composite Materials and Modeling of Mechanical Stress**
Y. RAKHILA, A. EZZAHI, A. MESTARI, A. ELMCHAOURI, Laboratory of Physical Chemistry and Bioorganic Chemistry, Faculty of Science and Techniques Mohammedia, Mohammedia, Morocco

Session CM-5
Geopolymers

CM-5:IL01 **Working Mechanisms of Superplasticizers on Alkali-Activated Cements**
M. PALACIOS[1], P. BOWEN[2], F. PUERTAS[1], [1]Eduardo Torroja Institute for Construction Science (IETcc-CSIC), Madrid, Spain; [2]École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland

CM-5:L02 **Multifunctional Waste-based Geopolymer Spheres**
R.M. NOVAIS, J. CARVALHEIRAS, M.P. SEABRA, J.A. LABRINCHA, Department of Materials and Ceramic Engineering / CICECO-Aveiro Institute of Materials, University of Aveiro, Campus Univ. de Santiago, Aveiro, Portugal

CM-5:L03 **Thermal Resistant Alkali-activated Materials Based on Various Aluminosilicate Sources**
M. FRICHETEAU, A. GHARZOUNI, S. ROSSIGNOL, Science des Procédés Céramiques et de Traitements de Surface (SPCTS), Limoges Cedex, France

CM-5:L04 **Mechanical and Thermal Properties of Fly Ash Based Geopolymer Composites**
P. TIMAKUL, P. HENPRASIRTTAE, DUANGDUEN ATONG, PAVADEE AUNGKAVATTANA, National Metal and Materials Technology Center and National Nanotechnology Center, Klong Luang, Pathumthani, Thailand

CM-5:L05 **Effect of Aluminum and Alkali Cation Earth Reactivity on Alkali-activated Materials Formation and Structure**
A. GHARZOUNI, L. OUAMARA, S. ROSSIGNOL, Science des Procédés Céramiques et de Traitements de Surface (SPCTS), Ecole Nationale Supérieure de Céramique Industrielle, Limoges, France; I. SOBRADOS, Instituto de Ciencia de Materiales de Madrid, Consejo Superior de Investigaciones Científicas (CSIC), Madrid, Spain

CM-5:L06 **Thermal Stability and Mechanical Properties of Wollastonite Reinforced Fly Ash-based Geopolymer**
K. HEMRA, S. JIEMSIRILERS, Department of Materials Science, Faculty of Science, Chulalongkorn University, Bangkok, Thailand; P. AUNGKAVATTANA, National Nanotechnology Center, Bangkok, Thailand; T. KOBAYASHI, Department of Materials Science and Technology, Nagaoka University of Technology, Niigata, Japan

CM-5:L07 **Synthesis of Geopolymer Foams: Application in the Retention of Heavy Metals**
K. KHATIB, H. BENBAKRIM, M. EL AZHARI, Cadi Ayyad University, Marrakech, Morocco

CM-5:L08 **Synthesis and Characterization of Alkali-activated Metakaolin/Slag Mixtures with TiO2 Nanoparticles**
L.Y. GOMEZ-ZAMORANO, E.A. LLANO GUERRERO, Universidad Autónoma de Nuevo León, Facultad de Ingeniería Mecánica y Eléctrica, Programa Doctoral en Ingeniería de Materiales, San Nicolás de los Garza, Nuevo León, México

CM-5:IL09 **Alkali Activated Green Building Materials - Selected Case Studies**
V. DUCMAN, Slovenian National Building and Civil Engineering Institute, Ljubljana, Slovenia

CM-5:L10 **Valorization of Biochar By-products into Alkali-activated Materials**
R. FARGES, A. GHARZOUNI, S. ROSSIGNOL, SPCTS, UMR 7315, Limoges cedex, France; P. JEULIN, B. RAVIER, Etablissement MAILLOT, Vernouillet, France

CM-5:L12 **Effect of NaOH Concentration and Curing Time on Mechanical Properties and Microstructure of Geopolymer Prepared from Kaolin Processing Waste**
S. PRASANPHAN, S. JIEMSIRILERS, Department of Materials Science, Faculty of Science, Chulalomgkorn University, Pathumwan, Bangkok, Thailand; T. KOBAYASHI, Department of Materials Science and Technology, Nagaoka University of Technology, Kamitomioka, Nagaoka, Niigata, Japan; A. WANNAGON, National Metal and Materials Technology Center, Thailand Science Park, Khlong Nueng, Khlong Luang, Pathum Thani, Thailand

CM-5:L13 **Formation, Structure and Mechanical Properties of Alkali-activated Materials Based on COx Argillite**
C. DUPUY[1, 2], A. GHARZOUNI[2], N. TEXIER-MANDOKI[1], X. BOURBON[1], S. ROSSIGNOL[2], [1]Agence nationale pour la gestion des déchets radioactifs (Andra), Chatenay-Malabry Cedex, France; [2]Science des Procédés Céramiques et des Traitements de Surface (SPCTS), Centre Européen de la Céramique, Limoges Cedex, France

CM-5:L14 **Synthesis of a New Geoplymer Based on Moroccan Pozzolana**
A. AZIZ[1], I.-E. EL AMRANI EL HASSANI[1], A. ELBOUARI[2], C. SADIK[2], [1]Laboratory Physicochemistry of Applied Materials / Faculty of Sciences Ben M'sik; [2]Laboratory of Geomaterials and Geoenvironment / Rabat Scientific Institute, Casablanca, Morocco

CM-5:IL15 **Lignocellulose-geopolymer Composites**
M. ILLIKAINEN, J. KIVENTERA, H. SREENIVASAN, A. AMMALA, J. YLINIEMI, P. KINNUNEN, University of Oulu, Fiber and Particle Engineering Research Unit, University of Oulu, Oulu, Finland

CM-5:IL16 **NMR Investigations on Silicate Compounds**
I. SOBRADOS, Instituto de Ciencia de Materiales de Madrid-Consejo Superior de Investigaciones Científicas. Madrid, Spain

CM-5:IL17 **Novel Perspectives in the Synthesis and Application of Aluminosilicate Matrix Composite Materials**
C. FERONE, G. ROVIELLO, L. RICCIOTTI, R. CIOFFI, Dipartimento di Ingegneria, Università di Napoli 'Parthenope', INSTM Research Group Napoli Parthenope, Napoli, Italy

SYMPOSIUM CN
REFRACTORIES: MEETING REFRACTORY INDUSTRY NEEDS OF TODAY AND IT'S FUTURE CHALLENGES

Session CN-1
Raw Materials Needs

CN-1:IL01 **Fabrication and Characterization of Highly Porous Alumina using Platelets**
SHINOBU HASHIMOTO, SAWAO HONDA, YUSUKE DAIKO, YUJI IWAMOTO, Nagoya Institute of Technology, Department of Life Science and Applied Chemistry, Nagoya, Japan

CN-1:IL02 **Raw Material Needs for Modern Clean Steel Technology and Refractories Engineering**
A. BUHR, Almatis GmbH, Frankfurt, Germany; R. BRUCKHAUS, Dillinger, Dillingen, Germany; R. FANDRICH, Stahlinstitut VDEh, Düsseldorf, Germany

CN-1:IL03 **Meeting the Future Needs of Refractory Raw Materials through Innovation**
H.S. TRIPATHI, Refractory & Traditional Ceramics Division, CSIR-Central Glass & Ceramic Research Institute, Kolkata, India

CN-1:L04 **Characterization of Porous Alumina Bodies Fabricated by High-temperature Evaporation of Boric Acid with Sodium Impurity**
DAIMU MUTO, SHINOBU HASHIMOTO, SAWAO HONDA, YUSUKE DAIKO, YUJI IWAMOTO, Nagoya Institute of Technology, Department of Life Science and Applied Chemistry, Nagoya, Japan

Session CN-2
Product Testing and Quality Control

CN-2:IL01 **Metastability, Energy Landscapes, and the Search for New Refractory Materials**
A. NAVROTSKY, University of California, Davis, CA, USA

CN-2:IL02 **New Approach of Corrosion Kinetics: High-temperature Time-resolved Raman and XRD Techniques and Applications**
E. DE BILBAO[1], M. DOMBROWSKI[1], R. MICHEL[1], M. RAMZI AMMAR[1], A. CAZINARES[1], H. PILLIERE[2], P. SIMON[1], J. POIRIER[1], [1]CEMHTI CNRS Univ. Orleans, Orleans, France; [2]Thermo Fisher Scientific Inel, France

CN-2:L03 **Three Stage Creep Behavior of MgO Containing Ordinary Refractories in Tension and Compression**
S. SCHACHNER, S. JIN, H. HARMUTH, D. GRUBER, Montanuniversitaet, Leoben, Austria

CN-2:L04 **Laser Induced Thermal Cycling and Hot Thermal Shock on Refractories Using TOM_wave**
H. FRIEDRICH, J. BABER, F. RAETHER, Fraunhofer Institute Silicate Research ISC, Fraunhofer-Center for High Temperature Materials and Design HTL, Bayreuth, Germany

CN-2:L05 **Analysis of the Fracture Behaviour of Magnesia-spinel Refractories by Digital Image Correlation**
I. KHLIFI, M. HUGER, IRCER, Université de Limoges, UMR CNRS 7315, CEC, Limoges Cedex, France; O. POP, GEMH, Université de Limoges, Egletons Cedex, France; J.-C. DUPRÉ, P. DOUMALIN, Institut Pprime, Université de Poitiers, UPR CNRS 3346, Futuroscope Chasseneuil Cedex, France

Session CN-3
Product Manufacturing and Installation

CN-3:IL01 **Carbon-bonded Monolithic: Innovation and Perspectives**
C. PAGLIOSA[1], V.C. PANDOLFELLI[2], [1]MAGNESITA S.A., Contagem, Brazil; [2]Federal University of São Carlos (UFSCar), Brazil

CN-3:IL02 **Applications of Microwave Heating to Refractory Materials**
HATSUO TAIRA, Krosaki Harima Corporation, Kitakyusyu, Japan

Session CN-4
Modelling and Simulation of the Process Environment

CN-4:IL01 **Application of Testing and Simulation for Fracture Mechanical Refractory Characterization**
H. HARMUTH[1], Y. DAI[2], D. GRUBER[1], S. JIN[1], [1]Montanuniversitaet Leoben, Leoben, Austria; [2]Wuhan University of Science and Technology, Wuhan, China

CN-4:IL02 **Thermo-chemo-mechanical Modelling of Refractories at High Temperatures: Basics, Keypoints and New Numerical Developments**
E. BLOND[1], A.K. NGUYEN[1, 2], T. SAYET[1], E. DE BILBAO[3], A. BATAKIS[2], M.-D. DUONG[4], [1]Université d'Orléans, LaMé, Polytech Orléans, Orléans, France; [2]Université d'Orléans, MAPMO, UMR CNRS 6628, Orléans, France; [3]Université d'Orléans, CEMHTI, UPR CNRS 3079, Orléans, France; [4]University of Science, Hochiminh city, Nguyen Van Cu,Vietnam

CN-4:L03 **Numerical Modelling by Discrete Element Method of Nonlinear Mechanical Behaviour of Refractories: Influence of Damage Involved by CTE Mismatch**
T.T. NGUYEN, D. ANDRE, N. TESSIER-DOYEN, M. HUGER, University of Limoges, UMR CNRS 7315 - IRCER, Centre Européen de la Céramique, Limoges, France

CN-4:IL04 **Interactions of Refractory Materials with Molten Gasifier Slag**
JINICHIRO NAKANO, A. NAKANO, AECOM, Albany, OR, USA; J.P. BENNETT, National Energy Technology Laboratory, U.S. Dept. of Energy, Albany, OR, USA

CN-4:IL05 **Thermodynamic Database for the Slag and Refractory System in the Coal Combustion Process**
IN-HO JUNG, M.-A. VAN ENDE, Department of Materials Science and Technology, Seoul National University, Seoul, South Korea; DONG-GEUN KIM, E. MOOSAVI-KHOONSARI, Department of Mining and Materials Engineering, McGill University, Montreal, QC, Canada; MINAMI TAI, RCCM, Tokyo, Japan

Session CN-5
Refractory Failure Analysis

CN-5:IL01 **Post-mortem Analysis of Refractory Wear in Metal Processing Caused by Slag and Temperature – The Importance of Understanding the Process and Requirements for the Slag**
A.M. GARBERS-CRAIG, Centre for Pyrometallurgy, Department of Materials Science & Metallurgical Engineering, University of Pretoria, Pretoria, South Africa

CN-5:L02 **Stability of Thermal Insulating Materials Used in Hall-Héroult Cells**
R. LUNENG, T. GRANDE, Department of Materials Science and Engineering, NTNU, Norwegian University of Science and Technology, Trondheim, Norway; S.N. BERTEL, J. MIKKELSEN, Skamol A/S, Nykøbing Mors, Denmark; A.P. RATVIK, SINTEF Materials and Chemistry, Trondheim, Norway

CN-5:L03 **MgO Refractory Wear in the Ferrovanadium Production Process**
M.C.J. VAN DER MERWE, R.D. CROMARTY, A.M. GARBERS-CRAIG, Centre for Pyrometallurgy, Department of Materials Science and Metallurgical Engineering, University of Pretoria, South Africa

CN-5:IL04 **Operational Issues in Slagging Gasifier Causing Refractory and Thermocouple Sensor Wear and Failure**
J.P. BENNETT, National Energy Technology Laboratory, U.S. Dept. of Energy, Albany, OR, USA; A. NAKANO, J. NAKANO, AECOM, Albany, OR, USA

CN-5:IL05 **An European Innovative Training Network dedicated to Refractories: ATHOR**
M. HUGER, University of Limoges, UMR CNRS 7315 - IRCER, Centre Européen de la Ceramique, Limoges, France

CN-5:L06 **Autopsy of Refractory Lining in Anode Baking Furnaces with Open and Closed Design**
T. BRANDVIK, T. GRANDE, NTNU Norwegian University of Science and Technology, Trondheim, Norway; A.P. RATVIK, SINTEF Materials and Chemistry, Trondheim, Norway

Session CN-6

Refractory Materials for Novel or Advanced Applications

CN-6:IL01 **Innovative Sintered Mullite-zirconia Refractory Composite for Hazardous Waste Incinerators**
A. VILLALBA WEINBERG[1, 2, 5], M.L. BOUCHETOU[1], E.S. FOTSO, O. JOUBERT[4], C. VARONA[5], D. GOEURIOT[2], **J. POIRIER**[1], [1]CNRS, CEMHTI UPR 3079, Univ. Orléans, Orléans, France; [2] LGF CNRS UMR 5307, Mines Saint-Etienne, France; [3]CARRD, Imerys, Villach, Austria; [4]Imerys Refractory Minerals Clerac; [5]Bony SA, Saint Etienne, France

CN-6:IL02 **Enhanced Mechanical Properties of Al2O3-C Refractories with Silicon Hybridized Expanded Graphite**
YAWEI LI, The State Key Laboratory of Refractories and Metallurgy, Wuhan University of Science & Technology, Wuhan, P.R. China

CN-6:L03 **Reactive Filter Collectors Based on Calcium Aluminates with Carbon for Clean Steel Approaches**
E. STORTI, D. VERES, M. FARHANI, C.G. ANEZIRIS, Institute of Ceramic, Glass and Construction Materials, TU Freiberg, Freiberg, Germany; C. WÖHRMEYER, Kerneos GmbH, Oberhausen, Germany; C. PARR, Kerneos SA, Puteaux, France

CN-6:IL04 **Flame Spraying Approaches for Advanced Refractory Applications**
P. GEHRE, C.G. ANEZIRIS, TU Bergakademie Freiberg, Institute of Ceramic, Glass and Construction Materials, Freiberg, Saxony, Germany

CN-6:IL05 **Refractory Filtering Materials for Clean Steel Technology**
C.G. ANEZIRIS, P. GEHRE, A. SCHMIDT, E. STORTI, S. DUDCZIG, J. HUBALKOVA Institute of Ceramic, Glass and Construction Materials, Technical University of Freiberg, Freiberg, Germany

CN-6:L06 **Study of Innovative Refractory Solutions for Improving Efficiency of Industrial Furnaces**
D. OLEVANO, U. Martini, P. Miceli, A. Di Donato, RINA CONSULTING - Centro Sviluppo Materiali S.p.A., Rome, Italy

Session CN-7

Future Refractory Education Needs

CN-7:IL01 **Complex Engineering Systems; The Next Step for the Ceramic Refractory Area**
V.C. PANDOLFELLI, Federal University of São Carlos - DEMa, São Carlos, SP, Brazil

CN-7:IL02 **The FIRE Compendium Series on Corrosion of Refractories to Match Educational Needs**
M. RIGAUD, Ecole Polytechnique, University of Montreal, Montreal, Quebec, Canada

CN-7:IL03 **How to Cover the Spectrum of Education Needs for the Refractory Industry**
P. QUIRMBACH, ECREF European Centre for Refractories, Höhr-Grenzhausen, Germany

CO - 8th International Conference

ADVANCED INORGANIC FIBRE COMPOSITES FOR STRUCTURAL AND THERMAL MANAGEMENT APPLICATIONS

Session CO-1

Production and Properties of Reinforcements, Preforms, and Matrix Materials

CO-1:IL01 **Oxide Ceramic Fibers - State of the Art and New Developments**
B. CLAUSS, S. PFEIFER, German Institutes of Textile and Fiber Research (DITF Denkendorf), Denkendorf, Germany; M.R. BUCHMEISER, DITF Denkendorf and University of Stuttgart, Institute of Polymer Chemistry, Stuttgart, Germany

CO-1:IL02 **High-performance SiC-polycrystalline Fiber**
TOSHIHIRO ISHIKAWA, Tokyo University of Science, Yamaguchi, Sanyo-Onoda, Yamaguchi, Japan

CO-1:IL03 **A Novel PAN/Silazane Hybrid Material for Processing of Carbon Fibers with Extraordinary Oxidation Resistance**
G. MOTZ, University of Bayreuth, Ceramic Materials Engineering, Bayreuth, Germany; L. RIBEIRO, R.A.F. MACHADO, Federal University of Santa Catarina Materials Engineering, Florianopolis, Brazil

CO-1:IL04 **Structure and Properties of Carbon Fibers**
H. PETERLIK, University of Vienna, Faculty of Physics, Vienna, Austria

CO-1:L05 **High Temperature Potential of Oxide Ceramic Fibers Investigated by Mini-composites Approach**
K. TUSHTEV, R.S.M. ALMEIDA, K. REZWAN, Advanced Ceramics, University of Bremen, Bremen, Germany

CO-1:L06 **In-situ Formed h-BN Platelet Reinforced Boron Carbide Composites Sintered via SPS**
FAN ZHANG, ZHENGYI FU, WEIMIN WANG, State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, Wuhan, China

CO-1:L07 **An Original Way to Produce Carbon Reinforcements: Polyoxometalate - Reduced Graphene Oxide Nanocomposite**
C. DEBIEMME-CHOUVY[1], B. THOMAS[2], I. LUCAS[1], M.M.T. TRAN[1], A. VEILLERE[2], J.-M. HEINTZ[2], J.-F. SILVAIN[2], [1]Laboratoire Interfaces et Systèmes Electrochimiques, LISE - UMR 8235, Sorbonne Universités, UPMC Univ Paris 06, CNRS, Paris, France; [2]Institut de Chimie de la Matière Condensée de Bordeaux, ICMCB-CNRS, Pessac Cedex, France

CO-1:IL08 **Development of Non-oxide Ceramic Fibers**
A. NOETH, A. RÜDINGER, Fraunhofer Center for High Temperature Materials and Design HTL, Bayreuth, Germany; M. ROTHMANN, Werner Humbs, BJS Ceramics GmbH, Germany

CO-1:IL09 **Production and Properties of High-temperature Resistant SiC Fiber and its Composites**
JUN WANG, HAO WANG, YANZI GOU, Science and Technology on Advanced Ceramic Fibers and Composites Laboratory, National University of Defense Technology, Changsha, P.R. China

CO-1:L10 **Manufacturing Condition using the MI-PIP Hybrid Technique to Make a High Thermal Conductive SiC Fiber-Reinforced SiC Matrix Composite**
KOHEI EJIRI, Tokyo University of Science, Noda-shi, Chiba, Japan; M. KOTANI, Japan Aerospace Exploration Agency, Mitaka-shi, Tokyo, Japan; S. OGIHARA, Tokyo University of Science, Noda-shi, Chiba, Japan

CO-1:L11 **Development of a Colloidal SiC-C-slurry for the Manufacturing of SiC/SiC Composites**
A. HELD, S. KNOHL, W. KRENKEL, Department of Ceramic Materials Engineering, University of Bayreuth, Bavaria, Germany

CO-1:L12 **Preceramic Prepreg Production and use to produce low cost CMCs**
C. MINGAZZINI, F. MAZZANTI, M. SCAFE' et al., ENEA-TEMAF, Faenza, Italy

CO-1:L13 **Thermal Condensation Reaction of Polydimethylsilane in a CO2 Atmosphere for Synthesis of Polycarbosilane**
MASAKI NARISAWA, KOUYA YAMADA, RINTARO HANATANI, HIROFUMI INOUE, Osaka Prefecture University, Sakai, Osaka, Japan

Session CO-2

Interfaces / Interphases

CO-2:IL01 **Active Metal Brazing of Composites for Thermal Management Applications**
R. ASTHANA[1], M. SINGH[2], N. SOBCZAK[3], J.J. SOBCZAK[3], [1]University of Wisconsin-Stout, Menomonie, Wisconsin, USA; [2]Ohio Aerospace Institute, Cleveland, OH, USA; [3]Foundry Research Institute, Krakow, Poland

CO-2:IL02 **Interfaces and Interface Design in CMCs**
J. LAMON, CNRS/Ecole Normale Supérieure Paris - Saclay, Laboratoire de Mécanique et Technologie, Cachan, France

CO-2:IL03 **Fiber-matrix Interfaces Optimized for Nuclear and Thermomechanical Applications**
C. FELLAH, **J. BRAUN**, C. SAUDER, Den-Service de Recherche de Métallurgie Appliquée (SRMA), CEA, Université Paris-Saclay, Gif-sur-Yvette, France; M.-H. BERGER, MINES ParisTech, PSL Research University, MAT - Centre des matériaux, CNRS UMR 7633, Evry, France

CO-2:IL04 **Preparation and Properties of Born-based Interphases for SiCf/SiC Composites**
SHAOMING DONG[1,2], JIANBAO HU[1,2], ZHENJIE QIAO[1,2], LIANGLAI MA[1,2,3], [1]State Key Laboratory of High Performance Ceramics and Superfine Microstructure; [2]Structural Ceramics and Composites Engineering Research Center Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, P.R. China; [3]Graduate University of Chinese Academy of Sciences, Beijing, P.R. China

CO-2:IL05 **Pyrocarbon Interphases in Carbon/Carbon and Ceramic-Matrix Composites: Modelling Activities**
G.L. VIGNOLES, University of Bordeaux, CNRS, Safran, CEA : Lab. for ThermoStructural Composites (LCTS) - UMR5801, Pessac, France

CO-2:L06 **RE2Si2O7 Disilicates: Promising Oxidation and Corrosion Resistant Weak Interface in SiCf/SiC CMC**
JINGYANG WANG, High-Performance Ceramics Division, Shenyang National Laboratory for Materials Science, Institute of Metal Research, CAS, Shenyang, China

Session CO-3
Processing and Fabrication of MMCS, CMCS, and C/C Composites

CO-3:IL01 **Design, Structure and Properties of Organomorphic Composites as New Materials**
E.A. BOGACHEV, Joint Stock Company "Kompozit", Korolev, Moscow region, Russia

CO-3:IL02 **Fast and Ultra-fast Sintering of Ceramics by Plastic Deformation as Dominating Mechanism**
ZHENGYI FU, Wuhan University of Technology, Wuhan, China

CO-3:L03 **Multi-functionally Graded Electroconductive Alumina**
I. HUSSAINOVA, Tallinn University of Technology, Tallinn, Estonia

CO-3:IL04 **Additive Manufacturing of Ceramics and Composites**
TATSUKI OHJI, NAOKI KONDO, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan

CO-3:IL05 **New Approaches for the Manufacture of C/C-SiC Composite Materials**
W. KRENKEL, N. LANGHOF, Ceramic Materials Engineering, University of Bayreuth, Bayreuth, Germany

CO-3:IL06 **Rapid Densification of CMCs by Controlling the Multi-scale Pores in CVI Process**
LAIFEI CHENG, Science and Techonology on Thermostructural Composite Materials Laboratory, Northwestern Polytechnical University, Xi'an, China

CO-3:IL07 **An Overview on the Recent Researches on Metal Matrix Composites**
Y. LE PETITCORPS, LCTS UMR 5801, University of Bordeaux, Pessac, France

CO-3:IL08 **Additive Manufacturing of Light Weight and High Power Density Propulsion Systems**
M.C. HALBIG, NASA Glenn Research Center, Cleveland, OH, USA; M. SINGH, Ohio Aerospace Institute, Cleveland, OH, USA

CO-3:IL09 **High Temperature Molybdenum Matrix Composites**
S. MILEIKO, Institute of Solid State Physics of Russian Academy of Sciences, Chernogolovka, Russia

CO-3:L10 **Ceramic Matrix Composites (CMCs) for High Temperature Industrial Applications**
L. CAVALLI, F. GIACOMETTI, F. BERNARDINELLO, Petroceramics spa, Stezzano, Italy

CO-3:L11 **Impact of Matrix Composition on the Properties of SiC/ SiC Ceramic Matrix Composites**
K. SCHOENFELD, H. KLEMM, Fraunhofer IKTS, Dresden, Germany

CO-3:L12 **New Large-scale Production Method for C/C-SiC Ceramics**
D.J. NESTLER, **J. STILLER**, L. KROLL, University of Technology Chemnitz, Chemnitz, SN, Germany

Session CO-4
Ultrahigh Temperature Ceramic Composites (UHTCCs) and Laminated Composite Structures

CO-4:IL01 **Joining of Ceramics and CMC for Extreme Applications**
M. FERRARIS, Politecnico di Torino, Torino, Italy

CO-4:IL02 **Mechanical Properties and Microstructure of Unidirectional UHTCCs**
L. ZOLI, A. VINCI, S. FAILLA, P. GALIZIA, D. SCITI, CNR-ISTEC, Faenza, Italy

CO-4:IL03 **Design, Fabrication and Properties of Cf/(ZrB2)-ZrC-SiC Ultra-high Temperature Ceramic Matrix Composites**
DE WEI NI, J. WANG, X. CHEN, S. DONG, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, China

CO-4:L04 **Novel UD UHTCMCs Produced by EPD and Sintering**
S. FAILLA[1, 2], L. ZOLI[1], P. GALIZIA[1], D. SCITI[1], [1]CNR-ISTEC, Faenza, Italy; [2]University of Parma, Italy

CO-4:L05 **Low Temperature Spark Plasma Sintering of TiB2 Ceramics with High-entropy Alloy as Sintering Aid**
WEI JI, ZHENGYI FU, State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, China

Session CO-5
Property, Modeling and Characterization

CO-5:IL01 **Multi-scale Modelling of CMCs**
E. BARANGER, LMT, ENS Paris-Saclay, CNRS Cachan, France

CO-5:L02 **A Nonlinear Model of Deformation of Porous Ceramics and Ceramic-matrix Composites at Loading and Unloading**
T. KARIMBAYEV, Central Institute of Aviation Motors, Moscow, Russia

CO-5:L03 **High Temperature Oxidation Resistance of SiC/SiC Composites in Air or Steam Environments**
KAZUYA SHIMODA, HIDEYUKI MURAKAMI, National Institute for Materials Science (NIMS), Tsukuba, Japan

Session CO-6
Composites for Thermal Management

CO-6:IL01 **Unsteady Modelling of CVI for Production of SiC-matrix Composites**
A.V. KULIK, M.S. RAMM, M.V. BOGDANOV, STR Group, Inc. - Soft-Impact, Ltd., Saint Petersburg, Russia; V.I. KULIK, Baltic State Technical University, Saint Petersburg, Russia

CO-6:IL02 **C/C-SiC Sandwich Structures**
B. HEIDENREICH, YUAN SHI, R. JEMMALI, D. KOCH, German Aerospace Center (DLR), Stuttgart, Germany

CO-6:L03 **Interphase Creation in Cu/C Composites using an Innovative Solid-liquid Co-existent Process**
C. AZINA[1, 2], I. CORNU[1], B. MORTAIGNE[3], Y.F. LU[2], **J.-F. SILVAIN**[1, 2], [1]Institut de Chimie de la Matière Condensée de Bordeaux (ICMCB), CNRS, Pessac, France; [2]Department of Electrical and Computer Engineering, University of Nebraska-Lincoln, Lincoln, NE, USA; [3]DGA/DS/Mission pour la Recherche et l'Innovation Scientifique, Paris, France

Session CO-7
Applications

CO-7:IL01 **Ceramic Composites for Space Structures**
M. KROEDEL, ECM Engineered Ceramic Materials GmbH, Moosinning, Germany

CO-7:IL02 **Recent CMC Technological Improvements for Aero Gas Turbine Applications**
E. BOUILLON, Safran Ceramics, Le Haillan, France

CO-7:IL03 **Ceramic Composites for Industrial High Temperature Applications**
R. WEISS, Schunk Kohlenstofftechnik GmbH, Heuchelheim, Germany

CO-7:IL04 **SiC/SiC for Fuel Cladding and Other Nuclear Applications**
C. SAUDER, J. BRAUN, C. LORRETTE, CEA Saclay, DEN/DMN, Gif sur Yvette, France

Poster Presentations

CA:P01 **Synthesis and Thermophysical Properties of Gd-doped La2Zr2O7 for Thermal Barrier Coatings**
MING YANG[1], XUEYING WANG[1], LI AI[2], LILI ZHAO[1], YONGPING ZHU[1], [1]State Key Laboratory of Multiphase Complex System, Institute of Process Engineering, Chinese Academy of Sciences, Beijing, P.R. China; [2]Science and Technology on Scramjet Laboratory, Beijing, P.R. China

CA:P02 **Synthesis of α-cordierite Oowder from Preheated Kaolinite, Talc and Alumina**
HSIN-WEN FAN, FU SU YEN, National Cheng Kung University, Tainan, Taiwan

CA:P03 **Synthesis of NIR-reflective CoFe2O4 Black Pigment Doped with CaO and Al2O3 Derived from Minerals**
N. SANGWONG, M. SUWAN, **S. SUPOTHINA**, National Metal and Materials Technology Center, National Science and Technology Development Agency (NSTDA), Klong Luang, Pathum Thani, Thailand

CA:P04 **The Effect of Varying Quantity and Particle Size of Cristobalite Powders during Synthesizing Cordierite**
YI-HSIN LIN, FU-SU YEN, HSING-I HSIANG, Department of Resources Engineering, National Cheng Kung University, Tainan, Taiwan

CA:P05 **Fabrication of Translucent Alumina by Vacuum Sintering at Low Temperature**
WEN-CHIAO HUANG, FU-SU YEN, CHI-YUEN HUANG, Department of Resources Engineering, National Cheng Kung University, Tainan, Taiwan

CA:P06 **γ+ α- Al2O3 Composite Powders for Fabricating Translucent Aluminas**
I-TING LIU, FU-SU YEN, M.C. TOM KUO, Department of Resources Engineering, National Cheng Kung University, Tainan, Taiwan

CA:P07 **Particle Size Distribution Variations Driven by Ostwald Ripening Processes**
MENG YING LEE, FU SU YEN, Department of Resources Engineering, National Cheng Kung University, Tainan, Taiwan

CA:P08 **Impact of Pressure in Static and Dynamic Pressing of Ultrafine Plasmochemical ZrO2 (Y)-Al2O3 Powders on Compact Density and Compaction Efficiency during Sintering**
T.S. FRANGULYAN, **S.A. GHYNGAZOV**, National Research Tomsk Polytechnic University, Tomsk, Russia

CA:P09 **On the Role of Microfibrillated Cellulose in the Microstructure and Properties of Ti(C,N)-based Cermet**
ZHENHUA YAO, Wuhan University of Science, Wuhan, Hubei, China

CA:P10 **Influence of Starting Powder Particle Size on Microstructure and Thermal Diffusivity of Y2O3 Containing Si3N4 Ceramics**
P. UYAN, S. TURAN BILECIK, S.E. University Vocational School Metallurgy Program, Bilecik, Turkey; Anadolu University Department of Materials Science and Engineering, Eskişehir, Turkey

CA:P11 **Silicon Carbide Ceramics Sintering with Yb2O3-Al2O3 as Additives**
YONG JIANG, LANER WU, North Minzu University, Xixia District, Yinchuan, China

CA:P12 **Effects of Added Nano Titanium on the Microstructure of Vitrified Bond Diamond Tools**
ZUN-KAI JHUANG[1], YUO-TERN TSAI[2], **KUAN-HONG LIN**[1], [1]Department of Mechanical Engineering, Tungnan University, New Taipei City, Taiwan; [2]Department of Mechanical Engineering, HungKuo Delin University of Technology, New Taipei City, Taiwan

CA:P13 **Synthesis, Processing, and Properties of Infrared Transparent Y2O3-MgO Nanocomposite**
DOO HYUN CHOI, SEOK-MIN YONG, KISU LEE, SEOK-YOUNG KO, DONG-IK CHEONG, Agency for Defense Development, Daejeon, South Korea

CA:P14 **Thermal Expansion Properties and Structural Analysis of ZrW2-xMoxO8**
HUI WEI, SHUNSUKE MIZUTANI, MAKOTO NOGUCHI, KEISHI NISHIO, Department of Materials Science and Technology, Tokyo University of Science, Tokyo, Japan; AKIHISA AIMI, KENJIRO FUJIMOTO, Department of Pure and Applied Chemistry, Tokyo University of Science, Chiba, Japan

CA:P15 **Preparation of Translucent Polycrystalline Alumina Ceramics by Vacuum Sintering**
HSIAO-TING TANG, JIA-ZHEN XIE, **CHI-YUEN HUANG**, Department of Resources Engineering, National Cheng Kung University, Tainan, Taiwan

CA:P16 **Effect of Two Step Sintering on Composites Containing ZrO2 and Al2O3**
A.S.A CHINELATTO, A.L. CHINELATTO, Universidade Estadual de Ponta Grossa, Ponta Grossa, PR, Brazil; C.L. OJAIME, E.M.J.A. PALLONE, Universidade de São Paulo, Pirassununga, SP, Brazil

CA:P17 **Peculiarities in Phase Development in the ZnO-stabilized ZrO2 System**
K. KUMAR, A. CHOWDHURY, Department of Materials Science & Engineering, Indian Institute of Technology Patna, Bihta, Bihar, India

CA:P18 **Development of High Strength-high Porosity Si3N4 Bodies via Modified Gel-casting Process**
A PARSI, F. GOLESTANIFARD, S.M. MIRKAZEMI, School of Metallurgy and Materials Engineering, Iran University of Science & Technology (IUST), Tehran, I.R. Iran

CB:P01 **Improvement of Optics, Mechanical Properties and Controlled-release Drug Delivery of Powder Cosmetics**
YASUMASA TAKAO, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, Japan

CB:P02 **Study of Mechanical Properties and the Hydrothermal Behavior of Ce-TZP/Al2O3 Sintered by Microwave**
L. GIL, M.D. SALVADOR, **A. BORRELL**, Instituto de Tecnología de Materiales, Universitat Politènica de València, Valencia, Spain; A. FERNANDEZ, Centro de Investigación en Nanomateriales y Nanotecnología (Consejo Superior de Investigaciones Científicas, Universidad de Oviedo, Principado de Asturias), El Entrego, Spain

CB:P03 **Preparation of Low Frictional Surfaces by Mimicking Firebrat's Scales**
SHUN UEMURA, YUJI HIRAI, MASATSUGU SHIMOMURA, Chitose Institute of Science and Technology, Chitose, Japan

CB:P04 **Evaluations of Barnacle Settlements on Self-assembled Monolayer Surfaces**
AI MOMOSE[1], YUTA SEGAWA[1], TAKAYUKI MUROSAKI[2], YUJI HIRAI[1], YASUYUKI NOGATA[3], MASATSUGU SHIMOMURA[1], [1]Chitose Institute of Science and Technology, Bibi, Chitose, Japan; [2]Asahikawa Medical University, Asahikawa, Japan; [3]Central Research Institute of Electric Power Industry, Abiko, Japan

CB:P05 **Ceramic Injection Moulding with 3D-printed Mold Inserts**
A.J. MEDESI, D. NÖTZEL, K. PURSCHE, T. HANEMANN, Institute for Applied Materials (IAM), Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen, Germany; M. FRANZREB, J. WOHLGEMUTH, Institute for Functional Interfaces (IFG), Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen, Germany

CB:P06 **Model of Thermocapillary Heat Transfer in a Porous Matrix**
V. PROKOF'EV, V. SMOLYAKOV, Tomsk State University, Tomsk, Russia

CB:P07 **Diagnostics of SHS: Time Resolved X-ray Diffraction**
V.I. PONOMAREV, D.YU. KOVALEV, Merzhanov Institute of Structural Macrokinetics and Materials Science, Russian Academy of Sciences, Chernogolovka, Russia

CB:P08 **Production of SHS Ceramics and Electrically Conductive Coatings on the Basis of MAX-phases and MXen Systems of Ti-Al-C**
A. SHULPEKOV, O. LEPAKOVA, Institution Tomsk Scientific Center, Siberian Branch, Russian Academy of Sciences, Tomsk, Russia

CB:P09 **Features of Dynamic, Structural and Emission Characteristics during SHS in Metallic Composites**
V.G. SALAMATOV, A.I. KIRDYASHKIN, R.M. GABBASOV, Tomsk Scientific Center, Siberian Branch, Russian Academy of Sciences, Tomsk, Russia, and Tomsk State University, Tomsk, Russia

CB:P10 **SH-synthesis of Metal-ceramic Composites of Various Purposes on the Basis of Mechanically Activated Energy-intensive Systems**
N. MOFA, B. SADYKOV, T. OSSEROV, A. BAKKARA, Institute of Combustion Problems, Almaty, Kazakhstan

CB:P11 **SHS of MAX Phase (Ti0.5Zr0.5)3AlC2**
D.YU. KOVALEV, S.V. KONOVALIKHIN, M.A. LUGININA, S.G. VADCHENKO, A.E. SYTSCHEV, Merzhanov Institute of Structural Macrokinetics and Materials Science, Russian Academy of Sciences, Chernogolovka, Russia

CB:P12 **Ceramic Coatings Based on the Ti-Cr-C System Obtained by the SHS Method**
R. GABBASOV, S. ALEXANDER, S. VITALY, Institution Tomsk Scientific Center, Siberian Branch, Russian Academy of Sciences, Tomsk, Russia

CB:P13 **Synthesis of ZnWO4 Ceramic Powders by Chemical Method: Correlation between Structural Evolution and Photoluminescent Properties**
I. COSTA NOGUEIRA[1], M. SOUSA DA SILVA GONDIM[2], P. SANTANA LEMOS[3], M. DE ASSIS[3], E. LONGO[3], E.R. LEITE[4], [1]Department of Physics, Federal University of Amazonas - UFAM, Brazil; [2]Federal Institute of Education, Science and Technology of Maranhão - IFMA, Brazil; [3]LIEC, Federal University of São Carlos - UFSCar, Brazil; [4]LNNANO, National Center for Research in Energy and Materials - CNPEM, Brazil

CB:P14 **Structure, Morphology, and Optical Properties of α-Ag2-2xMxWO4 (M = Zn2+, and Cu2+) Solid Solutions Obtained by Coprecipitation and by Femtosecond Laser**
P.F.S. PEREIRA, A.F. GOUVEIA, R.C. DE OLIVEIRA, M. ASSIS, E. LONGO, E.C. CORDONCILLO, H. BELTRÁN, G.M. VEGA, CDMF, LIEC, Chemistry Department of the Federal University of São Carlos (UFSCar), São Carlos, SP, Brazil; M. FERRER, Modeling and Molecular Simulations Group, Sao Paulo State University, Bauru, Brazil; R.M.L. BARELLES, J. ANDRÉS, Department of Analytical and Physical Chemistry, University Jaume I (UJI), Castellon, Spain

CB:P15 **Hydroxyapatite Synthesis using the Microwave Assisted Hydrothermal Method**
L. ANTUNES, G. STAFIN, A.V. CHAVES DE ANDRADE, C. PHILIPPINI FERREIRA BORGES, E.C. FERREIRA DE SOUZA, **S.R. MASETTO ANTUNES**, State University of Ponta Grossa, Ponta Grossa, Paraná, Brazil

CB:P16 **Synthesis and Characterization of Pseudoboehmite Obtained by Sol-gel Method Started with Aluminum Chloride (AlCl3) and Potassium Hydroxide (KOH)**
R.M. PERES, A.H. MUNHOZ Jr., L.F. MIRANDA, Mackenzie Presbiterian University, São Paulo, SP, Brazil

CB:P17 **Spark Plasma Sintering of Y-TZP/Al2O3-NbC Nanocomposites**
R.E.P. SALEM, Universidade Tecnológica Federal do Paraná, Londrina, PR, Brazil; F.R. MONTEIRO, A.L. CHINELATTO, A.S.A. CHINELATTO, Universidade Estadual de Ponta Grossa, Ponta Grossa, PR, Brazil; A. BORRELL, M.D.S. MOYA, Instituto de Tecnología de Materiales, Universidade Politécnica de Valencia, Valencia, Spain; C.L. OJAIMI, E.M.J.A. PALLONE, Universidade de São Paulo, Pirassununga, SP, Brazil

CB:P18 **Electrical Behavior and Microstructural Features of Conventionally and Electric Field-assisted Sintered 3 mol% Yttria-stabilized Zirconia**
S.G.M. CARVALHO, E.N.S. MUCCILLO, R. MUCCILLO, Center of Science and Technology of Materials, Energy and Nuclear Research Institute, São Paulo, SP, Brazil

CB:P19 **Flash Sintering of ZrO2 / Al2O3 Composites**
C.L. OJAIMI, J.A. FERREIRA, USP, Pirassununga, SP, Brazil; A.S.A. CHINELATTO, A.L. CHINELATTO, UEPG, Ponta Grossa, PR, Brazil; E.M.J.A. PALLONE, USP, Pirassununga, SP, Brazil

CB:P20 **Preparation and Characterization of Foam-glass with Low Density and High Mechanical Resistance using Glass Waste**
R. DOMINGUES, L.J. ALMEIDA, A.V.C. DE ANDRADE, E.C.F. SOUZA, M.E.P. ARRUA, A.C. ANTUNES, S.R.M. ANTUNES, **C.P.F. BORGES**, State University of Ponta Grossa, Ponta Grossa, Paraná, Brazil

CB:P21 **Effect of the Spinel Reduction Methods on Microstructure and Mechanical Properties of Al2O3-Co Composite**
J. BASERI, R. NAGHIZADEH, H. REZAIE, F. GOLESTANIFARD, School of Metallurgy and Materials Engineering, Iran University of Science and Technology, Tehran, Iran

CC:P01 **Boron Carbide/Graphene Platelet Ceramics with Improved Fracture Toughness, Functional and Tribological Properties**
R. SEDLAK[1], A. KOVALCIKOVA[1], J. BALKO[1], P. RUTKOWSKI[2], A. DUBIEL[3], E. MUDRA[1], V. GIRMAN[4], J. DUSZA[1], [1]Institute of Materials Research, Slovak Academy of Sciences, Division of Ceramic and Non-Metallic Systems, Košice, Slovak Republic; [2]AGH University of Science and Technology in Krakow, Faculty of Materials Science and Ceramics, Krakow, Poland; [3]The Institute of Advanced Manufacturing Technology, Krakow, Poland; [4]Pavol Jozef Šafárik University in Košice, Faculty of Science, Institute of Physics, Department of Condensed Matter Physics, Košice, Slovak Republic

CC:P02 **The Corrosion Behavior of Hybrid Zeolite on Aluminium Alloy (6082)**
A. LABED[1], D. NIBOU[2], M. OUDAH[1], B. IDIR[1], [1]Research Center in Industrial Technologies CRTI ex CSC, Chéraga, Algeria; [2]University of Science and Technology Houari Boumedine, El Alia, Algeries, Algeria

CC:P03 **Corrosion Protection of Ceramics Using Carbon-silver Film**
A.A. VIEIRA[1], A.C. SENE[1], M.A. RAMIREZ[1], P.A. RADI[1,2], S.F. SANTOS[3], J.V.C. SOUZA[3], L.VIEIRA[1,2], [1]University of Paraiba Valley-UNIVAP/IP&D, São José dos Campos, SP-Brazil; [2]Aeronautics Institute of Technology, ITA / LPP, São José dos Campos, SP-Brazil; [3]São Paulo State University (UNESP), School of Engineering, Department of Materials and Technology, Guaratinguetá, SP-Brazil

CC:P04 **Graphene Nanoplatelets Reinforced Plasma Sprayed Alumina-titania Coating with Improved Corrosion and Wear Resistances**
B. MUKHERJEE, R. SINGH, A. ISLAM, A. KUMAR KESHRI, Department of Materials Science and Engineering, Indian Institute of Technology Patna Bihta, Patna, Bihar, India

CC:P05 **Transparent DLC Films Development for Glasses Protection**
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CD:P01 **Atomic Interface Structure of Body Centered Cubic Metal/Ceramic Interface**
ENGANG FU, School of Physics, Peking University, Beijing, China; J.L. DU, School of Physics, Peking University, Beijing, China; X.D. DING, School of Materials Science, Xi'an Jiaotong University, Xi'an, China

CD:P02 **Theoretical Prediction and Experimental Determination of the Phase Transformation Sequence in Al-Ni Multilayer Termite Structures**
D.G. GROMOV, E.A. LEBEDEV, L.I. SOROKINA, National Research University of Electronic Technology (MIET), Moscow, Zelenograd, Russia; A.YU. TRIFONOV, Lukin Research Institute of Physical Problems, Zelenograd, Russia

CD:P03 **Investigation of Wave Combustion Processes in Multilayer Al-Ni Structures Formed on the Surface of Three-dimensional Silicon Structures**
E.A. LEBEDEV, D.G. GROMOV, National Research University of Electronic Technology (MIET), Moscow, Zelenograd, Russia; E.P. KITSYUK, YU.P. SHAMAN, Science-Manufacturing Center "Technological Centre", Moscow, Zelenograd, Russia; A.A. PAVLOV, Russian Academy of Sciences, Department of Development and Research of Micro- and Nanosystems, Moscow, Russia

CD:P04 **Joining Technology of Dielectric Materials with Metal Fittings of SHF Devices**
Y.V. PANFILOV, R.A. KARAKULOV, K.S. KOSAREVA, Bauman Moscow State Technical University, Moscow, Russia

CD:P05 **Welding of Silicon to Invar for Application in Synchrotron Light Instrumentation**
M.M. BELTANI AURICCHIO[1], O.R. BAGNATO[1], P.R. MEI[2], [1]Brazilian Synchrotron Light Laboratory, Campinas, SP, Brazil; [2]Faculty of Mechanical Engineering, Campinas, SP, Brazil

CD:P06 **Brazing Vacuum Ceramic Tubes for Magnets Aplications**
O.R. BAGNATO[1], R.F. FRANCISCO[1], A.L. GOBBI[2], T. FALVO[3], [1]Brazilian Synchrotron Light Laboratory, Campinas, SP, Brazil; [2]Brazilian Nanotechnology National Laboratory - LNNano; [3]Engecer Ltda, Brazil

CE:P01 **Fabrication and Mechanism of the Enhanced Mechanical Properties of Electrospun SiOC Ceramic Nanofibrous Membrane**
YINGDE WANG, NAN WU, BING WANG, Science and Technology on Advanced Ceramic Fibers and Composites Laboratory, National University of Defense Technology, Changsha, China

CE:P02 **In-situ Growth Nano-catalyst for Diverse Energy Devices**
JAE-HA MYUNG, Department of Materials Science and Engineering, Incheon National University, Incheon, South Korea

CE:P03 **Effect of Electrochemically Induced Phase Transformation on the Electrical and Mechanical Properties of Yttria-stabilized Zirconia**
KUK-JIN HWANG, TAE HO SHIN, Korea Institute of Ceramic Engineering and Technology, Gyeongsangnam-do, South Korea; HEESOO LEE, Pusan National University, Geumjeong-gu, Busan, South Korea

CE:P04 **ZnO Nanorods Array as Electrode for Supercapacitors and Photo-supercapacitors**
D. SOLIS[1], A. BRITO[1], E. NAVARRETE-ASTORGA[1], E.A. DALCHIELE[2], D. LEINEN[1], J.R. RAMOS-BARRADO[1], **F. MARTIN**[1], [1]Laboratorio de Materiales y Superficies. Departamentos de Física Aplicada & Ingeniería Química, Universidad de Málaga, Málaga, Spain; [2]Instituto de Física, Facultad de Ingeniería, Montevideo, Uruguay

CE:P05 **A Novel Ultrafast Inorganic Absorbent for Micropollutants in Aquatic Systems**
YAN XING, JING CHENG, WEI PAN, State Key Laboratory of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing, P.R. China

CE:P06 **Fabrication and Electro-catalytic Performances of Ce(Mn,Fe)O2 Infiltrated La(Sr)Cr(Mn)O3 Electrode**
JISEUNG RYU, HEESOO LEE, Pusan National University, Busan, South Korea; TAEHO SHIN, Korea Institute of Ceramic Engineering and Technology, South Korea

CE:P07 **In situ Activation for A-site Deficient La(Sr)A-xTi1-y(M)yO3 as a Potential Redox Stable Ceramic Anode for SOFCs**
HANBIT KIM, TAE HO SHIN, Korea Institute of Ceramic Engineering and Technology, Energy Materials Center Jinju-si, Gyeongsangnam-do, South Korea

CE:P08 **Preparation of Polymethylsilsesquioxane Aerogels with Improved Strength Using Strong Base Catalyst**
RYOTA UEOKA, KAZUYOSHI KANAMORI, KAZUKI NAKANISHI, Department of Chemistry, Graduate School of Science, Kyoto University, Japan

CE:P09 **New Ceramic Nanoparticle-reinforced Polyacrylates Fabricated by 3D Inkjet Printing and UV-curing**
D. GRAF, T. HANEMANN, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Baden-Württemberg, Germany; S. BURCHARD, University of Freiburg, Freiburg, Baden-Württemberg, Germany

CE:P10 **Maximizing Thermoelectric Performance of AgPbmSbTem+2 by Optimizing Spark Plasma Sintering Temperature**
JUN PEI[1], BO-PING ZHANG[1], JING-FENG LI[2], DOU-DOU LIANG[1], [1]The Beijing Municipal Key Laboratory of New Energy Materials and Technologies, School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China; [2]State Key Laboratory of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing, China

CE:P11 **Preparation of Monolithic Porous Mg-based MOFs via Sol-gel and Solvothermal Processes**
SEONGJU JEON, X. LU, K. KANAMORI, K. NAKANISHI, Department of Chemistry, Graduate School of Science, Kyoto University, Japan

CE:P12 **CuxS Superionic Compounds: Electronic Structure and Thermoelectric Performance Enhancement**
BO-PING ZHANG[1], LI-JUN ZHENG[1, 2], HE-ZHANG LI[1], JUN PEI[1], JIA-BING YU[3], [1]The Beijing Municipal Key Laboratory of New Energy Materials and Technologies, School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China; [2]School of High Temperature Materials and Magnesite Resources Engineering, University of Science and Technology Liaoning, Anshan, China; [3]Department of Materials Science and Engineering, Peking University, Beijing, China

CE:P13 **Synthesis and Deposition of Hematite Nanoparticles on FTO Substrate for Photovoltaic Applications**
Z. KHAKPOUR, **H. POURFARAHANI**, A. MAGHSOUDIPOUR, T. EBADZADEH, Ceramic Department, Materials and Energy Research Center, Tehran, Iran

CF:P01 **Chromium Carbide-ceramics Degradation Caused by Laser Treatment**
M. VLASOVA, M. KAKAZEY, M.C. RESENDIZ-GONZALEZ, CIICAp-UAEMor, Mexico; I. V. MEL'NIKOV, **YA. S. FIRONOV**, Moscow Institute of Physics and Technology, Russia; V.N. PETROVSKY, K. SERGEEV, National Research University for Nuclear Engineering, Russia

CF:P02 **Mechanical Properties of Thin Film Prepared by AlCr Based Single Alloy Target**
HAE WON YOON, K.I. MOON, Korea Institute of Industrial Technology, Heat Treatment R&D Group, Siheung-si, South Korea

CF:P03 **Spinel MgAl2O4 Formed by Plasma Spraying**
C. CTIBOR, Institute of Plasma Physics ASCR, Prague, Czech Republic; J. PETRASEK, J. SEDLACEK, Faculty of Electrical Engineering CTU, Prague, Czech Republic

CF:P04 **Dielectric Material Measurement of Hypersonic Electromagnetic Windows for High Temperature**
YINFANG XU, HUAN LIANG, Beijing Institute of Space Long March Vehicle, Beijing, China

CF:P05 **The Effect of Core to Shell Volume Ratio on the Mechanical Properties of Fibrous TaC-based Ceramics**
V. SHAHEDIFAR, **M. GHASSEMI KAKROUDI**, N. POURMOHAMMADIE VAFA, Unversity of Tabriz, Tabriz, Iran

CG:P01 **Microstructure Characterization of Ti-Al-C MAX Phases Obtained by SPS**
S. SIGNE GOUMWE, M. GONON, J.-P. ERAUW, M. DEMUYNCK, P. AUBRY, Materials Institut of University of Mons, Mons, Belgium

CG:P02 **Characterization and Simulation of Filler Element Incorporation in the Ti2AlC Ceramics**
CHENGJIE LU[1, 2], J. ZHANG[1], G. HUG[2], [1]Harbin Institute of Technology, Harbin, China; [2]LEM ONERA-CNRS, France

CG:P03 **Carbosilicothermic Synthesis of (Zr,Ti)3SiC2 and (Zr,Ti)4SiC3 MAX-phase Solid Solutions**
V.E. GRASS, P.V. ISTOMIN, E.I. ISTOMINA, A.V. NADUTKIN, Institute of Chemistry of Komi SC UB RAS, Syktyvkar, Russia; I.S. DMITRIEVA, Syktyvkar State University, Syktyvkar, Russia

CG:P04 **Rapid Preparation and Characterization of 2D Ti3C2 Nanocrystals**
SHUJUN HU, S.B. LI, J.P. JIANG, J. ZHANG, J. LIU, Center of Materials Science and Engineering, School of Mechanical and Electronic Control Engineering, Beijing Jiaotong University, Beijing, China

CG:P05 **Emphasis on the Crucial Role of the Etching Agent on the Reactivity of Ti3C2: Selective Formation in Water of TiO2@Ti3C2 Composite with Tunable Rutile/Anatase TiO2 and TiO2/Ti3C2 Ratios**
C. GARNERO, S. MORISSET, A. HABRIOUX, **S. CELERIER**, IC2MP, Poitiers, France; V. MAUCHAMP, S. HURAND, P. CHARTIER, Pprime, Poitiers, France

CH:P01 **Damage Detection of Multilayer Coating System by Digital Image Correlation at High Temperature**
RYO INOUE, Y. KOGO, Tokyo University of Science, Tokyo, Japan; H. KAKISAWA, National Institute for Materials Science (NIMS) Ibaraki, Japan

CH:P02 **Protective Aluminum Oxide-nitride Coatings on Stainless Steel**
A. CUEVAS, R. ROMERO, F. MARTIN, J.R. RAMOS-BARRADO, **D. LEINEN**, Laboratorio de Materiales y Superficie, Dpto. Física Aplicada I & Dpto. Ingeniería Química, Universidad de Málaga, Málaga, Spain

CH:P03 **Oxidation Behavior of Ytterbium Silicides**
TOSHIHISA MIYAZAKI, S. USAMI, R. INOUE, Y. KOGO, Tokyo University of Science, Tokyo, Japan

CH:P04 **Silicon Carbide Based Coatings for Graphite to Increase Oxidation Resistance**
E. SALERNITANO, F. BEZZI, S. GRILLI, F. BURGIO, P. FABBRI, G. MAGNANI, ENEA SSPT-PROMAS-TEMAF, Laboratory of Materials Technologies Faenza: Faenza (RA), Italy

CH:P05 **Use of Non-destructive Techniques for the Determination of Failure in Thermal Barrier Coatings**
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CH:P06 **Characterization of Glass Viscosity from Softening to Melting Point with Parallel Plate and Rotational Viscometry**
YOUNGNAM SONG, **JONGHUN YOON**, Department of Mechanical Engineering, Hanyang University, Ansan-si, Gyeonggi-do, South Korea

CH:P07 **Application of Tungsten Oxide Thin Films for Active Gases Detection**
M.V. CHUPRIN, **O.M. IVANOVA**, S.A. KRUTOVERTSEV, L.S. KRUTOVERTSEVA, A.E. TARASOVA, CJSC "Ecological sensors and systems", Zelenograd, Moscow, Russia

CH:P08 **DLC Impregnated with Clove Oil for Application in Surgical Tools**
A.C. SENE[1], T. BAESSO[1], L.A. MANFROI[1], A.A. VIEIRA[1], P. A. RADI[1, 2], L.C. SANT'ANA DA CRUZ[1], B.F. CAMELO[1], M.A. RAMIREZ[1], L.VIEIRA[1, 2], [1]Universidade do Vale do Paraíba- UNIVAP/ IP&D, Sao Jose dos Campos, SP-Brazil; [2]Instituto Tecnológico de Aeronáutica - ITA / LPP, São José dos Campos, SP-Brazil

CH:P09 **Study of Cavitation Erosion Experiments on Thermally Oxidized Rutile Phase TiO2 Films on Stainless Steel**
A. NEBATTI[1, 2, 3], C. PFLITSCH[1], B. ATAKANA[4], [1]Thermodynamics, IVG, Mechanical Engineering, University of Duisburg-Essen, Campus Duisburg, Duisburg, Germany; [2]University of Oran 1- Ahmed Ben Bella, Laboratory of Physics of Thin Films and Materials for Electronics, ELM Naouer, Oran, Algeria; [3]University Centre Belhadj Bouchaib of Ain-Temouchent, Institute of science and technology, Algeria; [4]CeNIDE, Center for Nanointegration Duisburg-Essen, Germany

CH:P10 **Synthesis and Studies on YPSZ and Rare-earth Zirconate Pyrochlore Multilayered TBCs**
K.T. PASUPULETI[1], P. RAMASWAMY[1], N. MURTHY SVS[2], [1]Mechanical Engineering, Faculty of Engineering, Christ University, Bangalore, India; [2]Vikram Sarabhai Space Center (VSSC), Trivandrum, India

CH:P11 **Wear Resistance of Plasma Sprayed Graphene Nanoplatelets Reinforced Alumina Coating in Dry and Wet Environment**
O.S. ASIQ RAHMAN, S. PRIYADERSHINI, A. KUMAR KESHRI, Materials Science and Engineering, Indian Institute of Technology Patna, Patna, Bihar, India

CH:P12 **Plasma Sprayed Carbon Nanotube and Graphene Nanoplatelets reinforced Alumina Hybrid Composite Coating with Outstanding Toughness**
B. MUKHERJEE, O.S. ASIQ RAHMAN, A. ISLAM, M. SRIBALAJI, **A. KUMAR KESHRI**, Materials Science and Engineering, Indian Institute of Technology Patna, Bihta, Patna, Bihar, India

CH:P13 **The Effect of Tungsten Doping on the Band-gap of VO2 Thin Films**
M. FALLAH VOSTAKOLA, B. EFTEKHARI YEKTA, S. MOHAMMAD MIRKAZEMI, Ceramic Division, School of Metallurgy and Materials engineering, Iran University of Science and Technology, Tehran, Iran

CI:P01 **Preparation and Characterization of Transparent SiO2 Sponges for Water Treatment**
F. LOEFFLER, E.C. BUCHARSKY, K.G. SCHELL, M.J. HOFFMANN, Institute for Applied Materials - Ceramic Materials and Technologies, Karlsruhe Institute of Technology, Germany

CI:P02 **Fabrication of Functional Porous Ceramics by In-situ Solidification Process for Mitigating Environmental Issues**
TAKASHI SHIRAI, YUNZI XIN, JEONG SOO HONG, Nagoya Institute of Technology, Nagoya, Japan

CI:P03 **Synthesis and Characterization of Ta2O5 Monolith with Co-continuous Macroporous Structure via Sol-gel Routea**
NAOTO MOCHIZUKI, K. KANAMORI, K. NAKANISHI, Department of Chemistry, Graduate School of Science, Kyoto University, Japan

CI:P04 **Multiscale Controlled Fe2O3 Monoliths via Polymerization-Induced Phase Separation**
YOSUKE HARA, K. KANAMORI, K. NAKANISHI, Department of Chemistry, Graduate School of Science, Kyoto University, Japan

CI:P05 **Preparation of Hierarchically Porous Cerium-based Monoliths from Metal Salt Precursor**
SHOTA MAKIMOTO, K. KANAMORI, K. NAKANISHI, Department of Chemistry, Graduate School of Science, Kyoto University, Japan

CI:P06 **Synthesis of MgO Porous Monoliths via Sol-gel Process Accompanied by Phase Separation**
XUANMING LU, K. KANAMORI, K. NAKANISHI, Department of Chemistry, Graduate School of Science, Kyoto University, Kyoto, Japan

CI:P07 **Wood-derived Ceramics for Microbial Fuel Cells**
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CI:P08 **Thermal and Physical Characterization of Composite Materials based on Plaster**
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CI:P09 **Improvement of the Clay Bentonite Catalytic Properties Aiming its Use as Heterogeneous Catalysts in the biodiesel Production**
D.S. MARINS, A.G. ADAMCZEVSKI, A.V. CHAVES DE ANDRADE, E.C. FERREIRA DE SOUZA, S.R. MASETTO ANTUNES, **M.E. PAYRET ARRUA**, State University of Ponta Grossa, Ponta Grossa, Paraná, Brazil

CJ:P01 **Magnetic and Dielectric Properties of Thermally Conductive Sheets Effective for Reducing Radiated Emissions from Heat Sinks**
TAKASHI TAKEO, N. OHTA, Mie University, Tsu, Mie, Japan; T. MATSUZAKI, Kitagawa Industries Co. Ltd., Kasugai, Aichi, Japan

CJ:P02 **Dielectric Relaxation and Electrical Properties of Piezoelectric Improved (Na0.53K0.47)(Nb1-xTax)O3 Ceramics**
JIN SOO KIM, H.S. LEE, Department of Physics, Changwon National University, Gyeongnam, South Korea

CJ:P03 **Porous PZT Films: Microstructure and Electrical Properties**
K. VOROTILOV, A. SIGOV, D. SEREGIN, N. KOTOVA, Moscow Technological University (MIREA), Moscow, Russia; L. DELIMOVA, N. ZAITSEVA, Ioffe Institute RAS, Saint-Petersburg, Russia

CJ:P04 **Dielectric Relaxation above Phase Transition Temperature in the Ba(1-x)EuxTiO3 Ceramics Fabricated by Sol-gel**
JONG-HO PARK, Department of Science Education, Chinju National University of Education, Jinju, Gyeongnam, South Korea

CJ:P05 **Synthesis of BaTiO3 Nanofibres and their Influence on the Properties of Barium Titanate Composite Fibers**
T. SEBASTIAN, A. MICHALEK, T. LUSIOLA, F. CLEMENS, Empa - Swiss Federal Laboratories for Materials Science and Technology, Laboratory for High Performance Ceramics, Dübendorf, Switzerland

CJ:P07 **Electrical Properties of ZrO2 Added Lithium-titanium-zinc Ferrite Ceramics**
E. LYSENKO, A. SURZHIKOV, S. NIKOLAEVA, Tomsk Polytechnic University, Tomsk, Russia

CJ:P08 **Study of Microstructure and Functional Properties of Layered BaTiO3-ferrite-BaTiO3 Magnetoelectric Composites Obtained by the SPS Method**
C.E. CIOMAGA[1], M. AIRIMIOAEI[2], A. GUZU[2], N. HORCHIDAN[2, 3], L.P. CURECHERIU[2], N. LUPU[4], F.M. TUFESCU[1, 3], **L. MITOSERIU**[2], [1]Research Department, Faculty of Physics, Dielectrics, Ferroelectrics & Multiferroics Group, Al. I. Cuza Univ. of Iasi, Iasi, Romania; [2]Dielectrics, Ferroelectrics & Multiferroics Group, Department of Physics, Al. I. Cuza Univ. of Iasi, Iasi, Romania; [3]GRADIENT Srl., Iasi, Romania; [4]National Institute of Research and Development for Technical Physics, Iasi, Romania

CJ:P09 **Structures and Magnetic Properties of Quadruple Perovskites**
YUKIO HINATSU, Y. DOI, M. WAKESHIMA, Hokkaido University, Sapporo, Japan

CJ:P10 **Local Electrostatic and Ferroelectric Properties of P(VDF-TrFE)/ Graphene and P(VDF-TrFE)/ Graphene Oxide Composite Nanofibers**
M.V. SILIBIN[1], V.S. BYSTROV[1, 2], D. KARPINSKY[1, 3], P. MIRZADEH[4], P.A.A.P. MARQUES[4], N. NASANI[4], G. GONCALVES[4], B.A SINGH[4], I.K. BDIKIN[1, 4], [1]National Research University of Electronic Technology, Shokina Square, Building 1, Zelenograd, Moscow, Russia; [2]Inst. Mathematical Problems of Biology, Keldysh Institute of Applied Mathematics RAS, Pushchino, Moscow region, Russia; [3]Scientific-Practical Materials Research Centre of NAS of Belarus, Minsk, Belarus; [4]TEMA-NRD, Mechanical Engineering Department and Aveiro Institute of Nanotechnology (AIN), University of Aveiro, Aveiro, Portugal

CJ:P11 **Development and Application of Hybrid Materials Obtained by In situ and Ex situ Synthesis**
C. VENEGAS[1, 2], S. BOLLO[1], D. RUIZ[2], [1]Universidad de Chile, Santiago, Chile; [2]Universidad de Santiago de Chile, Santiago, Chile

CJ:P12 **Composite with Mixed Conductivity for Fuel Cells**
T. KABBAS JUNIOR, E.C. GRZEBIELUCKA, A.S.A. CHINELATTO, **A.L. CHINELATTO**, Departamento de Engenharia de Materiais, Universidade Estadual de Ponta Grossa, Ponta Grossa, Brazil; G.C. MATHER, Instituto de Cerámica y Vidrio, CSIC, Madrid, Spain

CJ:P13 **Electrical Characterization of SrTiO3 Solid Solution with Pr3+ and Zr4+**
G. LOPEZ-PACHECO, A. REYES-MONTERO, M.E. VILLAFUERTE-CASTREJÓN, Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México, Ciudad de México, México; F. GONZÁLEZ-GARCÍA, Departamento de Ingeniería de Procesos e Hidráulica, Universidad Autónoma Metropolitana, Ciudad de México, México

CJ:P14 **Structural and Microwave Dielectric Properties of xBa3MgNb2O9–(1-x)Ba2InNbO6 [x = 0.4, 0.6, 0.8]**
A. DUTTA, S.K. SINGH, V.R.K. MURTHY, P.K.MUKHOPADHYAY, T.P. SINHA, Department of CMPMS, S.N. Bose National Centre for Basic Sciences, Salt Lake, Kolkata, India; Microwave Laboratory, Department of Physics, Indian Institute of Technology Madras, Chennai, India; Department of Physics, Bose Institute, Kolkata, India

CJ:P15 **Citrate Precursor Synthesis, Structural Characterization and Dielectric Properties of Ba1-xCaxZrO3 (0.05 ≤ x ≥ 0.20) Nanoparticles**
M. UBAIDULLAH, T. AHMAD, The Glocal University, Mirzapur pole, Saharanpur, India; Jamia Millia Islamia, New Delhi, India

CJ:P16 **Microstructure and Electrical properties of B- Site Modified Bismuth Sodium Barium Titanate Ferroelectric Ceramic**
E. ZEREFFA, Chemistry program, School of Applied Natural Science, Adama Science & Technology University, Ethiopia

CJ:P17 **Structural, Dielectric and Optical Analysis of Li2O–Nb2O5–TiO2 Based Dielectric Ceramics**
S. BAHEL, R. SINGH, Dept. of Electronics Technology, GND University, Amritsar, India

CK:P01 **Multiglass Property in the Multiferroic Spin-chain Compound Sm2BaNiO5**
A. INDRA, K. DEY, S. GIRI, Department of Solid State Physics, Indian Association for the Cultivation of Science, Jadavpur, Kolkata, India

CK:P02 **Coexistence of Ferroelectricity and Magnetic Memory in Double Perovskite La3Ni2NbO9**
K. DEY, A. INDRA, S. GIRI, Department of Solid State Physics, Indian Association for the Cultivation of Science, Jadavpur, Kolkata, India

CL:P01 **Emission Properties of Nd3+: Y2Si2O7 Nanocrystals under High Power Excitation**
R. TOMALA, W. STREK, Institute for Low Temperature and Structure Research, Polish Academy of Sciences, Wroclaw, Poland

CL:P02 **Crystal Structure, Electronic Structure, and Photoluminescence Properties of Eu3+ Doped (Li,Na,K)LaMgWO6 Red Phosphors**
WEIGUANG RAN[1], **JUNG HYUN JEONG**[1], KIWAN JANG[2], HO SUEB LEE[2], [1]Department of Physics, Pukyong National University, Busan, South Korea; [2]Department of Physics, Changwon National University, Changwon, South Korea

CL:P03 **Direct-write Photolithography for Rapid Prototyping of Silicon Nitride Waveguides on Silicon**
D.B. BONNEVILLE, H.C. FRANKIS, J.D.B. BRADLEY, Department of Engineering Physics, McMaster University, Hamilton, Ontario, Canada

CL:P04 **Structural and Optical Properties of Nanocrystalline ZnS:Tb Thin Films Grown by Sol-gel Method**
A .TOUNSI, **D. TALANTIKITE-TOUATI**, R. KHALFI, H.HADDAD, Department of Chemistry, LGE Laboratory, Abderrahmane Mira University, Bejaïa, Algeria; H. MERZOUK, Department of Physic, Abderrahmane Mira University, Bejaïa, Algeria

CL:P05 **Cataion Exchange Mediated Synthesis of Ternary Alloyed Plasmonic Cu3BiS3-xSex Nanorods**
S. PAUL, S.K. DE, Department of Materials Science, Indian Association for the Cultivation of Science, Kolkata, India

CM:P01 **Densification Behavior of Clay Brick Body Incorporated with Coffee Grounds Waste**
K.A. VASCONCELLOS, P.F. BUSCH, **J.N.F. HOLANDA**, Group of Ceramic Materials/LAMAV, Northern Fluminense State University - UENF, Campos dos Goytacazes, RJ, Brazil

CM:P02 **Study of Industrial WastesTreated by Hydrocyclones for Use in Ceramic Mass Formulations**
A. ARAUJO, L. CAMPOS, D. MACEDO, **R. DUTRA**, Federal University of Paraíba, João Pessoa, Paraíba, Brazil

CM:P03 **Pigmented Glazed Ceramic Roof Tiles: Optical Behavior Using the Kubelka-Munk Model in Solar Spectrum Range**
L.M. SCHABBACH, M. FREDEL, CERMAT - UFSC, Florianopolis, Santa Catarina, Brazil; D.L. MARINOSKI, S. GÜTHS, CB3E - UFSC, Brazil; A.M. BERNARDIN, UNESC, Brazil

CM:P04 **The Yellow Pavement of Sofia - How to Recover this Important Historical Heritage?**
A. KARAMANOV, B. RANGUELOV, **S. ATANASOVA-VLADIMIROVA**, I. PIROEVA, E. KARAMANOVA, D. TACHEV, G. AVDEEV, Institute of Physical Chemistry "Acad. Rostislaw Kaishew", Bulgarian Academy of Sciences, Sofia, Bulgaria

CN:P01 **High-temperature Ceramic Sensors for Assessing Refractory and Component Conditions**
K. SABOLSKY, G.A. YAKABOYLU, K.A. SIERROS, E.M. SABOLSKY, M.R. COMPARETTO, D.S. REYNOLDS, West Virginia University, Morgantown, WV, USA; J. BOGAN, M. RAUGHLEY, J. SAYRE, Harbison Walker International Technology Center, West Mifflin, PA, USA

CN:P02 **The Investigation of the Effects of Phenolic Resin and Wastes Pyrolytic Liquids on the Physical and Mechanical Behaviours of MgO-C Refractories**
T. BAHTLI, V.M. BOSTANCI, Necmettin Erbakan University, Konya, Turkey; D.Y. HOPA, Afyon Kocatepe University, Afyonkarahisar, Turkey

CN:P03 **Evolution of Physical and Mechanical Properties of a Low Cement High-alumina Refractory Castable**
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CN:P04 **Study on the Slag Phases and Physical Properties Evolution during Foaming Practice Applied to Prolong BOF Lining Life**
E. BRANDALEZE, L. SANTINI, Fisicoquímica de alta temperatura, Departamento Metalurgia - DEYTEMA - UTN - Facultad Regional San Nicolás, Argentina

CN:P05 **Development of High Alumina Cement Bonded Monolithic Refractories from Egg Shells**
Sk S. HOSSAIN, R. PYARE, P. KUMAR ROY, Department of Ceramic Engineering, Indian Institute of Technology (BHU), Varanasi, (U.P.), India

CO:P01 **Fabrication of SiC Fiber Textiles via Silicidation of Carbon Fabrics with SiO Gas**
E.I. ISTOMINA, P.V. ISTOMIN, A.V. NADUTKIN, Institute of Chemistry of Komi SC UB RAS, Syktyvkar, Russia

CO:P02 **In Situ Fabrication of SiC Fibers with Controllable Carbon Layer for Excellent High-temperature Resistance**
YANZI GOU, HAO WANG, JUN WANG, National University of Defense Technology, Changsha, China

CO:P03 **Nanocomposites of Pseudoboehmite Polystyrene**
A.H. MUNHOZ Jr., M.A. SOUZA VASCONCELOS, R.M. PERES, T.J. MASSON, L.F. MIRANDA, R. OLIVEIRA, Universidade Presbiteriana Mackenzie, São Paulo, SP, Brazil; H.T.T.S. MELO, UNIGEL, São Paulo, SP, Brazil

CO:P04 **Effect of CVI C Layer's Thickness on Mechanical Properties of C/C-SiC Composites Prepared by Gaseous Silicon Infiltration Process**
RONGJUN LIU, HUAMING MIAO, Science and Technology on Advanced Ceramic Fibers and Composites Laboratory, National University of Defense Technology, Changsha, P.R. China

CO:P05 **High-temperature Stability of Carbon Fiber Reinforced Polymer-derived SiAlOC Composites under Different Environment**
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