

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:IL05 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:IL06 Synthesis of Indium Hydroxide Powders by a Precipitation Method

WOO-SEOK CHO¹, EUN-KYOUNG CHOI^{1,2}, WON-JUN LEE^{1,3}, KYU-SUNG HAN¹, UNG-SOO KIM¹, JIN-HO KIM¹, KWANG-TEAK HWANG¹, JONG-YOUNG KIM¹, HAE-JIN HWANG³, KWANG-BO SHIM², ¹Korea Institute of Ceramic Engineering and Technology, Icheon, South Korea; ²Dept. of Materials Science and Engineering, Hanyang University, Seoul, South Korea; ³School of Material Science and Engineering, Inha University, Incheon, South Korea

CA-1:IL07 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 MEERBEEK², J. VLEUGELS¹, ¹Dept. of Metallurgy and Materials Engineering, KU Leuven, Kasteelpark Leuven, Belgium; ²KU Leuven BIOMAT, Dept. of Oral Health Sciences, KU Leuven & Dentistry, University Hospitals Leuven, Leuven, Belgium

CA-1:IL08 Structural and Transport Properties of Neodymium Tungstates Prepared via Mechanochemical Activation

Y.N. BESPALCO, 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:IL09 High-performance Nanostructured T'-YSZ Feedstocks Synthesized by Nanopowder Granulation

FEIFEI ZHOU^{1,2}, YOU WANG¹, MIN LIU², YAMING WANG¹, LIANG WANG³, ¹Dept of Materials Science, School of Materials Science and Engineering, Harbin Institute of Technology, Harbin, China; ²National 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; ³Key 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:IL03 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. VLEUGELS¹, H. REVERON³, T. FÜDERER⁴, S. SCHOMER⁴, N. COURTOIS⁵, A. LIENS³, B. VAN MEERBEEK², J. CHEVALIER³, ¹University of Leuven, Dept of Materials Engineering, Heverlee, Belgium; ²University of Leuven & Dentistry, BIOMAT, Dept of Oral Health Sciences, University Hospitals Leuven, Leuven, Belgium; ³University of Lyon, UMR CNRS 5510 (MATEIS), INSA de Lyon, France; ⁴Ceramic Materials, Swerea IVF AB, Mölndal, Sweden; ⁵ANTHOGYR, 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:IL07 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:IL04 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:IL05 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:IL06 Comparison of Different Methods for Polycrystalline Er:YAG Ceramics

M. LAGNY, J. BOEHLER, E. BARRAUD, S. LEMONNIER, S. BIGOTTA, M. EICHHORN, Institut franco-allemand de recherches de Saint Louis, Saint Louis, France; Y. LORGUILLOUX, 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:IL09 Development of Transparent Ceramics: Understanding and Control of Microstructure

R. STOCKY, J. BOEHLER, S. LEMONNIER, French-German Research Institute of Saint-Louis, France; Y. LORGUILLOUX, A. LERICHE, University of Valenciennes and Hainaut-Cambrésis, France

CA-3:IL10 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:IL06 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:IL08 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. LORGUILLOUX², S. LEMONNIER¹, E. BARRAUD¹, S. BIGOTTA, A. LERICHE², M. EICHHORN¹, ¹Institut franco-allemand de recherches de Saint-Louis, Saint-Louis, France; ²Laboratoire des Matériaux Céramiques et Procédés Associés, Boulevard Charles de Gaulle, Maubeuge, France

CA-4:IL09 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:IL11 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:IL12 Sintering and Viscous Behavior of a Low Temperature Co-fired Ceramic (LTCC) - From Experimental Characterization to Numerical Simulation of Co-sintering

A. HEUX¹, G. ANTOU¹, N. DELHOTE², N. PRADEILLES¹, A. MAITRE¹, ¹Univ. Limoges, CNRS, SPCTS, UMR 7315, France; ²Univ. Limoges, CNRS, XLIM, UMR 7252, France

CA-4:IL13 Ultrastrong Zirconia Ceramics Fabricated by an Oscillatory Pressure Sintering Process

TIANBIN ZHU^{1,2,3}, ZHIPENG XIE³, YAWEI LI^{1,2}, ¹The State Key Laboratory of Refractories and Metallurgy, Wuhan University of Science and Technology, Wuhan, China; ²National-provincial Joint Engineering Research Center of High Temperature Materials and Lining Technology, Wuhan University of Science and Technology, Wuhan, China; ³State 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. REVERON¹, FEI ZHANG¹, M. FORNABAIO², P. PALMERO², L. MONTANARO², T. FÜRDERER³, N. COURTOIS⁴, J. CHEVALIER¹, ¹Université de Lyon-INSA de Lyon, MATEIS CNRS UMR 5510, Villeurbanne Cedex, France; ²Department of Applied Science and Technology, INSTM R.U. POLITO, LINCE Lab., Politecnico di Torino, Torino, Italy; ³DOCERAM, MOESCHTER GROUP Holding GmbH & Co. KG, Dortmund, Germany; ⁴Anthogyr 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:IL06 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. BORYSIK, 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 Universität 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:IL03 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:IL04 Synthesis of Nanometric Cerium Oxide-based Powders for Catalytic and Energetic Applications

A. GONDOLINI¹, E. MERCADELLI¹, S. ALBONETTI², A. SANSONI¹, ¹ISTEC-CNR, Faenza, Italy; ²Department of Industrial Chemistry "Toso Montanari", University of Bologna, Bologna, Italy

CB-1:IL05 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:IL03 Multiple Stages of Structure Formation in Silicon Oxycarbide Ceramics

P. KROLL, The University of Texas at Arlington, Arlington, TX, USA

CB-2:IL04 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 Nationale Supérieure de Chimie de Montpellier & Institut Universitaire de France, Montpellier, France

CB-2:IL06 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:IL07 Novel Glass-ceramics from Glass Powders and Reactive Pre-ceramic Polymer Binders

H. ELSAYED^{1,2}, E. BERNARDO¹, ¹Department of Industrial Engineering, University of Padova, Italy; ²Ceramics Department, National Research Centre, El-Bohous Street, Cairo, Egypt

CB-2:IL08 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:IL09 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. MARINEL¹, R. MACAIGNE¹, D. GOEURIOT², S. SAUNIER², ¹CRISMAT Laboratory, University of Caen Normandy, France; ²Ecole des Mines de Saint-Etienne, Dép. Science des Matériaux et des Structures, Saint-Etienne, France

CB-3:IL03 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. DURUPHTY, 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

CB-3:IL06 Fast Manufacturing of Ceramics by Coupling Stereolithography and Microwave Sinterings

A. THUAULT, H. CURTO, F. JEAN, J.-C. HORNEZ, A. LERICHE, LMCPA Laboratory of Ceramic Materials and Associated Processes, University of Valenciennes and Hainaut Cambrésis, Maubeuge, France

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:IL03 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:IL04 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. MANIERE¹, G. CHEVALLIER¹, L. DURAND², F. AHMAD¹, G. CHEVALLIER¹, A. WEIBEL¹, F. MAUVY³, R. EPHERRE¹, C. ELISSALDE³, M. MAGLIONE³, C. ESTOURNES¹, ¹CIRIMAT, Université de Toulouse, CNRS, UT3, INPT, Toulouse Cedex, France; ²CEMES, Univ. Toulouse, CNRS, Toulouse Cedex, France; ³ICMCB, CNRS UPR 9048, Université Bordeaux, Pessac, France

CB-4:IL07 Sintering Behavior of Zinc Oxide under DC field by EDXRD

H. BICER, Dumlupinar 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 Inst. for Materials Science, Tsukuba, Japan

CB-4:IL09 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:LO3 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:LO3 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:LO4 Effect of Gold Nanoparticles on Corrosion Behavior of Melting Gel Coatings on Stainless Steel

L.C. KLEIN¹, **S. KALLONTZI¹**, **L. FABRIS¹**, **A. ARPINO¹**, **A. JITIANU^{2,3}**, **J. MOSA⁴**, **M. APARICIO⁴**, ¹Rutgers University, Department of Materials Science and Engineering, Piscataway, NJ, USA; ²Department of Chemistry, Davis Hall, Lehman College-CUNY, Bronx, NY, USA; ³Chemistry Program, The Graduate Center, The City University of New York, New York, NY, USA; ⁴Instituto 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. ELISHAV¹, **V. BEILIN²**, **G.E. SHTER²**, **G.S. GRADER²**, ¹The Nancy and Stephen Grand Technion Energy Program, Technion I.I.T, Haifa, Israel, ²The Wolfson Department of Chemical Engineering, Technion I.I.T, Haifa, Israel

CB-6:LO7 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:LO8 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 Building Materials Group of Research. School of Mines, Universidad Nacional de Colombia, Medellín, 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:LO3 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:LO4 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:LO5 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:LO6 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:LO7 Bioprocess Inspired Synthesis of Functional Materials

HAO XIE^{1,2}, Zheng-Yi Fu¹, ¹State Key Lab of Advanced Technology for Materials Synthesis and Processing; ²School of Chemistry, Chemical Engineering, and Life Science, Wuhan University of Technology, Wuhan, China

CB-8.1:LO8 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. KATANAIEV, University of Lausanne, Lausanne, Switzerland

CB-8.2:LO3 Mechanical Properties and Constitutive Behavior of 3-D Supercrystalline Nanocomposites

B. BOR, D. GIUNTINI, B. DOMENECH, D. BENKE, G.A. SCHNEIDER, Institute of Advanced Ceramics, Hamburg University of Technology, Hamburg, Germany

CB-8.2:LO4 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. MIHAILESCU¹, C. RISTOSCU¹, A. BIGI², ¹National Institute for Lasers, Plasma and Radiation Physics, Magurele, Ilfov, Romania; ²Department of Chemistry "G. Ciamician", University of Bologna, Bologna, Italy

CB-8.3:IL02 Flexible and Superhydrophobic Vulcanized Rubber Microstructures

YUJI HIRAI¹, RIKU TAMURA¹, MASATSUGU SHIMOMURA¹, YASUTAKA MATSUO², TAKAHIRO OKAMATSU³, TOSHIIKO ARITA⁴, ¹Chitose Institute of Science and Technology, Chitose, Hokkaido, Japan; ²RIES, Hokkaido university, Sapporo, Hokkaido, Japan; ³THE YOKOHAMA RUBBER CO., LTD, Hiratsuka, Kanagawa, Japan; ⁴IMRAM, Tohoku university, Sendai, Miyagi, Japan

CB-8.3:IL03 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:IL03 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:IL04 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. SPARENBERG, 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:IL05 Additive Manufacturing of Geopolymers by Local Laser Curing

P. HLAVACEK¹, T. MUEHLER², J. LUECHTENBORG¹, P. STURM¹, G.J.G. GLUTH¹, H.-C. KUEHNE¹, J. GUENSTER^{1,2}, ¹Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany; ²TU 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:IL03 Additive Manufacturing of AlN Based UV-curable Dispersions

P. OZOG^{1,2}, D. KATA², T. GRAULE¹, ¹Laboratory for High Performance Ceramics, Empa, Dübendorf, Switzerland; ²Faculty 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:IL04 Ethylene Vinyl Acetate as a Binder for Fused Deposition Modelling of Ceramic

L. GORJAN¹, L. REIFF^{1,2}, A. LIERSCH², F. CLEMENS¹, ¹Empa - Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland; ²Department 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:IL05 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:IL06 Development of Photo-curable Ceramic Resin with High Dispersion Stability for SLA 3D Printing Application

SEYEON SONG^{1,2}, **JUNG WOO LEE**¹, **JI SUN YUN**¹, ¹Electronic Convergence Materials Division, Korea Institute of Ceramic Engineering and Technology, Jinju, South Korea; ²Department of Materials Engineering, Pusan National University, Busan, South Korea

CB-9.4:IL07 Manufacturing of Multimaterial Parts using Hybrid Additive Manufacturing Machine

C. CHAPUT, 3DCeram, Limoges, France; 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:IL09 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:IL02 Aerosol Jet® Technology for Printed Electronic Devices Comprising Ceramics

M.A. PIECHOWIAK¹, G. ETCHEGOYEN¹, A. DELAGE², N. DELHOTE², A. ABDELGHANI², ¹Centre de Transfert de Technologies Céramiques (CTTC), Limoges Cedex, France; ²Laboratoire XLIM - UMR CNRS 7252 - Université de Limoges, Limoges Cedex, France

CB-9.5:IL03 Direct 3D Printing of Aluminum Nitride Using Ovalbumin As The Natural Binder

WAI HOONG KOK¹, K.C. YUNG¹, T.C. ANG², ¹Department of Industrial and Systems Engineering, Faculty of Engineering, The Hong Kong Polytechnic University, Hong Kong; ²School 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:IL02 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:IL03 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:IL04 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:IL07 Digital Printing of Glass-ceramic Glazes

M. CANNIO¹, D.N. BOCCACCINI¹, V. RIVA¹, M. HANUSKOVA¹, M. ROMAGNOLI¹, R. TAURINO², F. BONDIOLI², M. TOGNETTI³, M. CICONI⁴, T. FEY⁴, V. NOVARESI⁵, A.R. BOCCACCINI⁶, ¹Dipartimento di Ingegneria Enzo Ferrari, Università di Modena e Reggio Emilia, Italy; ²Dipartimento di Ingegneria e Architettura, Università di Parma, Italy; ³Daxel S.r.l., Rubiera RE, Italy; ⁴Institute of Glass and Ceramics, Department of Materials Science and Engineering, University of Erlangen-Nuremberg, Erlangen, Germany; ⁵ALLOVIS Engineering, Torino, Italy; ⁶Institute 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 Nanofibers

O. POLITANO, Laboratoire ICB UMR 6303 CNRS-Université 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. ORRU¹, G. TALLARITA, R. LICHERI, G. CAO, Dipartimento di Ingegneria Meccanica, Chimica e dei Materiali, Università degli Studi di Cagliari, Cagliari, Italy

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:IL05 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. SHTANSKY¹, A.V. BONDAREV¹, A.M. KOVALSKII¹, K.L. FIRESTEIN^{1,2}, P.A. LOGINOV¹, D.A. SIDORENKO¹, N.V. SHVINDINA¹, I.V. SUKHORUKOVA¹, ¹National University of Science and Technology "MISIS", Moscow, Russia; ²School of Chemistry, Physics and Mechanical Engineering, Queensland University of Technology (QUT), Brisbane, QLD, Australia

CC-1:IL06 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:IL09 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:IL10 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:IL11 Mechanical Properties and Wear Behaviour of Boron Carbide/Graphene Platelet Ceramics

R. SEDLAK¹, **A. KOVALCIKOVA**¹, J. BALKO¹, P. RUTKOWSKI², A. DUBIEL², E. MUDRA¹, V. GIRMAN^{3,1}, J. DUSZA¹, ¹Institute of Materials Research, Slovak Academy of Sciences, Division of Ceramic and Non-Metallic Systems, Kosice, Slovak Republic; ²AGH University of Science and Technology in Krakow, Faculty of Materials Science and Ceramics, Department of Ceramics and Refractories, Krakow, Poland; ³Pavol 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 MELLO¹, C. BINDER¹, R. BINDER², A.N. KLEIN¹, ¹Federal University of Santa Catarina, EMC, Florianópolis, SC, Brazil; ²Whirpool / Embraco, Joinville, SC, Brazil; ³Federal University of Uberlândia, Uberlândia, MG, Brazil

CB-10.2:IL02 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:IL03 NiO and WO3 Coreduction by Combined Reducers Mg/C and Preparation of W-Ni Alloy

M.K. ZAKARYAN^{1,2}, S.V. AYDINYAN³, S.L. KHARATYAN^{1,2}, ¹A.B. Nalbandyan Institute of Chemical Physics NAS RA, Yerevan, Armenia; ²Yerevan State University, Yerevan, Armenia; ³Tallinn University of Technology, Tallinn, Estonia

CB-10.2:IL04 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:IL06 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:IL07 MoSi2 based Composites Preparation by Combustion Synthesis with Subsequent Selective Laser Sintering

T. MINASYAN¹, M.A. RODRIGUEZ², LE LIU¹, M. AGHAYAN¹, L. KOLLO¹, I. HUSSAINOVA^{1,3,4}, ¹Tallinn University of Technology, Tallinn, Estonia; ²Instituto de Ceramica y Vidrio (ICV-CSIC), Madrid, Spain; ³ITMO University, St. Petersburg, Russia; ⁴University 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. SORARU¹, University of Trento, Trento, Italy

CB-10.3:IL04 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:IL04 Solution Combustion Synthesis of Gadolinium Oxide Nanopowders: Influence of the Fuel on the Properties of the Material

J. MONNIER¹, X. DESCHANELS¹, C. REY¹, E. WELCOMME², ¹CEA Marcoule, Institut de Chimie Séparative de Marcoule (ICSM) - LNER; ²CEA Marcoule, ATALANTE - DMRC, France

CC-1:IL13 Tribocchemistry 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. SANTOS³, J.V.C. SOUZA³, L.VIEIRA^{1,2}, ¹Instituto Tecnológico de Aeronáutica (ITA), São José dos Campos, SP, Brazil; ²Universidade do Vale do Paraíba (Univap), Urbanova, São José dos Campos - SP, Brazil; ³Universidade 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}, ¹UNESP - Universidade Estadual Paulista, Fac. Ciências Bauru, São Paulo, Brazil; ²IBTN/Br - Brazilian Branch of the Institute of Biomaterials, Tribocorrosion and Nanomedicine, Brazil; ³Postgraduate 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 KIM², KYOUNG IL MOON¹, ¹Korea Institute of Industrial Technology, Heat Treatment R&D Group, Siheung-si, South Korea; ²School 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:IL04 Controllable Synthesis of Al₄SiC₄ by Carbothermal Reduction Method and its Oxidation Behavior at High Temperature

BIN LI¹, JUNHONG CHEN¹, XINMEI HOU², XINMING XING¹, KUO-CHIH CHOU², ¹School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China; ²State 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. BAESSO¹, A.C. SENE¹, L.A. MANFROI, A.A. VIEIRA¹, P. A. RADI^{1,2}, M. A. RAMIREZ¹, T.C.A.SANTOS¹, **L.VIEIRA**^{1,2}, ¹University of Paraíba Valley-UNIVAP/ IP&D, Sao José dos Campos, SP-Brazil; ²Aeronautics Institute of Technology, ITA / LPP, Sao José dos Campos, SP-Brazil

CC-2:L11 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. SENE², M.A. RAMIREZ², P. LEITE², L.VIEIRA^{1,2}, ¹Instituto Tecnológico de Aeronautica (ITA), Sao José dos Campos, SP, Brazil; ²Universidade 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 Research 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. ADABIFIROOZJAEI¹, F. EMADI², P. KOSHY¹, C.C. SORRELL¹, ¹School of Materials Science and Engineering, UNSW Australia, Sydney, NSW, Australia; ²Department 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. KOVACEVIC³, D.P. SEKULIC^{1,2}, S.DJ. MESAROVIC³, ¹University of Kentucky, Lexington, KY, USA; ²Harbin Institute of Technology, China; ³Washington State University, USA

CD-3:IL04 Joining of UHTC Composite using Powder-based Metallic Interlayer

NORITAKA SAITO, KUNIIHIKO 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, TOSHIKI 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 Multimateriaux 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, Dübendorf, 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. WESTIN¹, S.N. KATEA¹, M. LEIDEBORG^{1,3}, K. LASHGARI^{1,3}, K. JANSSON², ¹Chemistry-Angstroem, Angstroem Laboratory, Uppsala University, Uppsala, Sweden; ²Materials and Environmental Chemistry, Arrhenius Laboratory, Stockholm University, Stockholm, Sweden; ³S-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 TANEMURA¹, M.I. ARABY¹, R. VISHWAKARMA¹, M.S. ROSMI², S. SHARMA¹, Y. WAKAMATSU¹, K. TAKAHASHI¹, G. KALITA¹, M. KITAZAWA³, Y. YAAKOB⁴, M.Z.M. YUSOP⁵, ¹Dept. of Frontier Materials, Nagoya Inst. of Tech., Showa-ku, Nagoya, Japan; ²Dept. of Chemistry, Faculty of Science and Mathematics, Universiti Pendidikan Sultan Idris, Tanjong Malim, Perak, Malaysia; ³Olympus Co. Ltd., Nagano, Japan; ⁴Dept. of Physics, Univ. Putra Malaysia, UPM Serdang, Selangor, Malaysia; ⁵Dept. 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 Nanocrystals 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. MARORELL*, ICFO - Institut de Ciències 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. KUPRENAITE¹, **S. GRIESSE-NASCIMENTO**², **S. MARGUERON**³, **C. MILLON**¹, **D. RADDENZATI**¹, **E. MAZUR**², **A. BARTASYTE**¹, ¹FEMTO-ST institute, Université Bourgogne Franche-Comté, ENSMM, Besançon, France; ²School of Engineering and Applied Sciences, Harvard University, Cambridge, USA; ³LMOPS Laboratory, Université de Lorraine et CentraleSupélec, Metz, France

CE-2:L10 Enhancement of Oxygen Reduction Reaction (ORR) Catalytic Activity on the Modified Surface of La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-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 Bio-medical 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 TAMAYO¹, B. GARCIA², E. CASADO³, ¹Ceramics and Glass Institute, CSIC, Madrid, Spain; ²Universidad Rey Juan Carlos, Madrid, Spain; ³Universidad Politécnica 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. NAFARI¹, C.C. BOWLAND², **H.A. SODANO**^{1,3}, ¹Department of Aerospace Engineering, University of Michigan, Ann Arbor, MI, USA; ²Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA; ³Department 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. MATOVIC¹, J. MALETASKIC^{1,2}, J. LUKIC¹, M. PREKAJSKI DJORDJEVIC¹, M. FAJAR², K. YOSHIDA², T. YANO², ¹Centre of Excellence-CextremeLab, Institute for Nuclear Sciences Vinca, University of Belgrade, Belgrade, Serbia; ²Lab. 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, ISTECC-CNR, Faenza, Italy

CF-1:IL05 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:IL06 Development of High Temperature Na₂SO₄-NaCl-ceramic Composites for Solar Thermal Energy Storage

YIFENG JIANG¹, **YANPING SUN²**, SEAN LI¹, ¹University of New South Wales, Sydney, NSW, Australia; ²CSIRO 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:IL09 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:IL10 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:IL11 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:IL12 Preparation of Highly Macroporous Monolithic Transition Metal Borides/Carbides by Polymerization-induced Phase Separation

FEI LI^{1,2}, XIAO HUANG², GUO-JUN ZHANG¹, ¹State Key Lab. for Modification of Chemical Fibers and Polymer Materials, Research Institute of Functional Materials, Donghua University, Shanghai, China; ²Shanghai 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-SOLVAS¹, D. GÓMEZ-GARCÍA², A. DOMÍNGUEZ-RODRÍGUEZ², W.E. LEE¹, ¹Centre for Nuclear Engineering (CNE), Dept. Materials, Imperial College London, UK; ²Dept. 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. REBILLAT¹, S. ARNAL¹, F. MAUVY², ¹Laboratoire des Composites Thermostructuraux, Pessac, France; ²Institut de Chimie de la Matière Condensée de Bordeaux, Pessac, France

CF-2:IL05 Cyclic Oxidation of Ti₃Al-based Materials

I. CVIJOVIC-ALAGIC, M.T. JOVANOVIĆ, 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

JIZOU, 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:IL08 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:IL11 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:IL12 Oxidation Behavior of HfB₂-SiC and ZrB₂-SiC Ultra-high Temperature Ceramics in Different Air Atmospheres

C. PIROU, 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:IL13 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:IL14 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-Bergakademie 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 Appliquées, CEA, Université 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. PRIKHNA¹, **P.P. BARVITSKIY¹**, V.B. MURATOV², S.N. DUB¹, V. DOMNICH³, M.V. KARPETS¹, R. HABER³, ¹Institute for Superhard Materials of the National Academy of Sciences of Ukraine, Kiev, Ukraine; ²Institute for Problems in Material Science, NAS Ukraine, Kiev, Ukraine; ³Department 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. MOSHTAGHIUN, 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. MOSHTAGHIUN, 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. SILVESTRONI¹, D. SCITI¹, J. WATTS², W. FAHRENHOLTZ², G. HILMAS², ¹CNR-ISTEC, Faenza, Italy; ²Dept. of Materials Science and Engineering, Missouri University of Science and Technology, Rolla, MO, USA

CF-3:L15 Graphene-reinforced Alumina and Zirconia Composites: On their Potential Applications
R. CANO-CRESPO, B.M. MOSHTAGHIUN, 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?
YOSHIIHIRO TAMURA, B.M. MOSHTAGHIUN, 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. RETAMAL¹, R. CANO-CRESPO², R. VALLE-FUENTES¹, M. LAGOS¹, B.M. MOSHTAGHIUN², D. GOMEZ-GARCIA^{2,3}, R. MORENO⁴, A. DOMINGUEZ-RODRIGUEZ², ¹Facultad de Ingeniería, Universidad de Talca, Campus Los Niches, Curicó, Chile; ²Departamento de Física de la Materia Condensada, Universidad de Sevilla, Sevilla, Spain; ³Instituto de Ciencia de Materiales de Sevilla, CSIC-US, Sevilla, Spain; ⁴Instituto 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 PETITCORPS², H. PLAISANTIN^{1,2}, J. ROGER², ¹Safran CERAMICS; ²University of Bordeaux, LCTS, UMR 5801, Pessac, France

CF-4:L03 Pitfalls of Determining the Elastic Properties of Stabilized Zirconia with Indentation Methods
K. WERBACH¹, S. HUMMEL¹, C. EBNER¹, U. LOHBAUER², H. PETERLIK¹, ¹University of Vienna, Vienna, Austria; ²University 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. OUISSE¹, D. PINEK¹, M.W. BARSOUM², T. ITO³, ¹Université Grenoble-Alpes, CNRS, LMGP, Grenoble, France; ²Department of Materials Science and Engineering, Drexel University, Philadelphia, PA, USA; ³Synchrotron 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. DAHLQVIST¹, A. MOCKUTE¹, A. PETRUHINS¹, G.K. PALSSON^{3,4}, J. ROSEN¹, ¹Thin Film Physics, Department of Physics, Chemistry and Biology (IFM), Linköping University, Linköping, Sweden; ²Grein Research, Reykjavik, Iceland; ³Dept. of Physics and Astronomy, Uppsala University, Uppsala, Sweden; ⁴Institut 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^{1,2}, T. LAPAUW^{1,2}, B. TUNCA^{1,2}, K. VAN LOO¹, K. LAMBRINOUP², ¹KU Leuven, Department of Materials Engineering, Heverlee, Belgium; ²SCK•CEN, Mol, Belgium

CG-2:IL03 Magnetic MAX-phases: The Ultimate Material Class for Innovations in Spin-based Technologies ?

M. FARLE, R. SALIKHOV, U. WIEDOWALD, 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:IL05 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. PRADEEP³, J. SCHNEIDER³, R. DELVILLE¹, J. HADERMANN⁴, J. VLEUGELS², K. LAMBRINOUP¹, ¹Belgian Nuclear Research Centre, SCK•CEN, Mol, Belgium; ²Dept. of Materials Engineering, KU Leuven, Heverlee, Belgium; ³Materials Chemistry, RWTH Aachen University, Aachen, Germany; ⁴Dept. of Physics, University of Antwerp, Antwerp, Belgium

CG-2:IL06 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 Ripplifications: 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 Multimateriaux 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. RENO, 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. RADOVIC¹, R. BENITEZ², HULI GAO², YEXIAO CHEN¹, WEN HAO KAN³, G. PROUST³, P. NAIK PARRIKAR⁴, ARUN SHUKLA⁴, ¹Department of Material Science and Engineering, Texas A&M University, College Station, TX, USA; ²Department of Mechanical Engineering, Texas A&M University, College Station, TX, USA; ³School of Civil Engineering, The University of Sydney, NSW, Australia; ⁴Department 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:IL08 Relationship between Microstructure and Oxidation Resistance of Ti₃AlC₂ MAX Phase

V. GAUTHIER-BRUNET¹, E. DROUELLE^{1,2}, J. CORMIER¹, P. VILLECHAISE¹, S. DUBOIS¹, P. SALLOT², ¹Institut Pprime, CNRS, Université de Poitiers, ENSMA, UPR CNRS 3346, Futuroscope Chasseneuil, France; ²Safran CRT, Magny-les-Hameaux Cedex, France

CG-3:IL09 Corrosion Behaviour of MAX Phases in Molten Solar Salt and Liquid Heavy Metal

K. VAN LOO¹, T. LAPAUW^{1,2}, P. SZAKÁLOS³, K. LAMBRINOUP², J. VLEUGELS¹, ¹KU Leuven, Department of Materials Engineering, Heverlee, Belgium; ²SCK•CEN, Mol, Belgium; ³KTH, Surface and Corrosion Science, Stockholm, Sweden

CG-3:IL10 Experimental and Theoretical Investigations on MAX/ Intermetallic Two-phase Materials

G. HUG¹, K. PIVEN¹, A. JANKOWIAK², C. LU^{1,3}, JIE ZHANG³, ¹LEM ONERA-CNRS, Chatillon, France; ²DMAS ONERA, Châtillon France; ³Harbin Institute of Technology, Harbin, China

CG-3:IL11 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:IL12 Tensile Creep Properties of Ti₃AlC₂

S. DUBOIS¹, E. DROUELLE^{1,2}, J. CORMIER¹, V. GAUTHIER-BRUNET¹, P. VILLECHAISE¹, P. SALLOT², ¹Institut Pprime, CNRS - Université de Poitiers - ENSMA, UPR CNRS 3346, Futuroscope Chasseneuil, France; ²Safran 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:IL02 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:IL03 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. HOSEH, 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. CABIOTCH, 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 Mo_{1.33C} 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 P¹, 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. PAZNIK, D. KUZNETSOV, MUST "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. NOVOSELOVA¹, R. SALIKHOV¹, U. WIEDWALD¹, M. SPASOVA¹, J. ROSEN², M. FARLE^{1,3}, ¹Faculty of Physics and Center for Nanointegration Duisburg-Essen (CENIDE), University Duisburg-Essen, Duisburg, Germany;

²Thin Film Physics Division, Department of Physics, Linköping University, Linköping, Sweden; ³Center 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 Ti₃C₂T_x 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 ZHENG¹, P.G. ZHANG¹, W.B. TIAN¹, J. CHEN¹, Y.M. ZHANG², Z.M. SUN¹, ¹Jiangsu Key Laboratory of Advanced Metallic Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China; ²Jiangsu 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 YANG¹, P. ZHANG¹, W. ZHENG¹, W.B. TIAN¹, J. CHEN¹, Y.M. ZHANG², Z.M. SUN¹, ¹Jiangsu Key Laboratory of Advanced Metallic Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China; ²Jiangsu 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. VILLA¹, M. NAGUIB², ¹Department of Chemistry, University of Milan, Milan Italy; ²Department 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. LAMBRINO¹, T. LAPAUW^{1,2}, B. TUNCA^{1,2}, J. VLEUGELS², ¹Belgian Nuclear Research Centre, SCK•CEN, Mol, Belgium; ²Department of Materials Engineering, KU Leuven, Heverlee, Belgium

CG-9:L07 Effect of Temperature and Atmosphere on Sn Whisker Growth on Ti₂SnC

YUSHUANG LIU¹, P. ZHANG¹, W.B. TIAN¹, Y.M. ZHANG², Z.M. SUN¹, ¹Jiangsu Key Laboratory of Advanced Metallic Materials, School of Materials Science and Engineering, Southeast University, Nanjing, P.R. China; ²Jiangsu 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 Functional 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. KHAN¹, M. KASHIF¹, A. FARID¹, R.S. RAWAT², R. AHMAD³, ¹Department of Physics, Government College University, Faisalabad, Pakistan; ²National Institute of Education, Nanyang Technological University, Singapore; ³Department 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. VASSEN¹, D.E. MACK¹, O. GUILLON^{1,2}, ¹Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research, Materials Synthesis and Processing (IEK-1), Jülich, Germany; ²Jülich 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 JANG¹, KOUICHI YASUDA², SEONGWON KIM³, YOON-SUK OH³, HYUNG-TAE KIM³, ¹Research Center for Structural Materials, National Institute for Materials Science, Tsukuba, Japan; ²Department of Materials Science and Engineering, Tokyo Institute of Technology, Tokyo, Japan; ³Engineering 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. LOFAJ¹, D. MEDVED¹, M. KABATOVA¹, J. NOHAVA², J. DOBROVODSKY³, P. NOGA³, ¹Institute of Materials Research of SAS, Kosice, Slovakia; ²Anton Paar, Peseux, Switzerland; ³Advanced 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. KARAZHANOV¹, J. MONTERO¹, D. MOLDAREV^{1,2}, A. TABATABAEI³, E. MURAT BABA³, E. STRUGOVSHCHIKOV⁴, CH.CH. YOU¹, A. PISHTSHEV⁴, D. PRIMETZHOFFER², H. PALONEN², M. WOLFF², E.O. ZAYIM³, E.S. MARSTEIN¹, ¹Department for Solar Energy, Institute for Energy Technology, Kjeller, Norway; ²Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden; ³Istanbul Technical University, Istanbul, Turkey; ⁴Institute 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-VILLALOBOS¹, J.J. RUIZ-VALDES¹, V. BARBIERI², C. SILIGARDI², E.I. CEDILLO-GONZALEZ¹, ¹Universidad Autónoma de Nuevo León, Facultad de Ciencias Químicas, San Nicolás de los Garza, N.L., México; ²Università 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, Ghent, Belgium

CH-6:L04 Friction Regimes of Water-lubricated Diamond (111): The Role of Interfacial Ether Groups and Tribo-induced Aromatic Surface Reconstructions

TAKUYA KUWAHARA¹, G. MORAS¹, **M. MOSELER**^{1,2}, ¹Fraunhofer IWM, MicroTribology Center μ TC, Freiburg, Germany; ²Institute 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:L01 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 Nitriding Processing and ZrO₂ as Catalyst

YUNPING 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:IL05 Preparation of Low-cost Gangue Porous Ceramic Microspheres for Wastewater Adsorption

SHU YAN¹, YIMING PAN², KE GAN¹, JINLONG YANG^{1,2}, ¹State Key Laboratory of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing, P.R. China; ²School of Materials Science and Engrg, Dalian Jiaotong University, Dalian, Liaoning, P.R. China

CI-1:IL06 Solidification Templating of Porous Polysilazane-derived Ceramics

T. KONEGGER, R. OBMANN, TU Wien, Institute of Chemical Technologies and Analytics, Vienna, Austria

CI-1:IL07 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 Structures 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:IL10 Porous Glass-ceramics from Alkali Activation and Sinter-crystallization of Waste Glass Mixtures

P. RABELO MONICH¹, A. RINCON ROMERO¹, D. HÖLLEN², E. BERNARDO¹, ¹Dipartimento di Ingegneria Industriale, Università degli Studi di Padova, Padova, Italy; ²Chair of Waste Processing Technology and Waste Management, Montanuniversität Leoben, Leoben, Austria

CI-1:IL11 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:IL12 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:IL14 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:IL15 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:IL16 Effect of Starch Addition on the Cordierite Membranes Performances

W. MISRAR^{1,2,3}, M. LOU TOU⁴, L. SAADI², M. MANSORI¹, Y. RAKHILA⁵, S. VILAIN³, M. WAQIF², C. FAVOTTO³, ¹LCME, Laboratoire de Chimie des Matériaux et d'Environnement, Faculté des Sciences et Techniques, Université Cadi Ayyad, Marrakech, Morocco; ²LMCN, Laboratoire de Matière Condensée et Nanostructures, Faculté des Sciences et Techniques, Université Cadi Ayyad, Marrakech, Morocco; ³IM2NP, Institut Matériaux Microélectronique Nanosciences de Provence, Université de Toulon, Bât R, La Garde-Cedex, France; ⁴Faculté Pluridisciplinaire de Nador, Université Mohammed 1er, Selouane, Nador, Morocco; ⁵Laboratoire de chimie physique et de chimie biorganique, Faculté des Sciences et Techniques Mohammedia, Université Hassan II de Casablanca, Mohammédia, 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:IL18 Tailoring the Microstructure of TiO₂ Photoactive Electrodes by using Cellulose Nanofibers and by Polyelectrolyte Multilayer Absorption

Z. GONZALEZ GRANADOS¹, J. YUS¹, A.J. SANCHEZ-HERENCIA¹, A. RODRÍGUEZ², J. DEWALQUE³, L. MANCERIU³, C. HENRIST³, B. FERRARI¹, ¹Institute of Ceramics and Glass, CSIC, Tailoring through Colloidal Processing Group 5, Madrid, Spain; ²Chemical Engineering Department, University of Cordoba, Campus de Rabanales, Cordoba, Spain; ³University of Liege, Group of Research in Energy and Environment from Materials (GREENMAT), Liege, Belgium University

CI-1:IL19 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:IL05 Micro-meso Porous Alkali Bonded Ceramics as Solid Adsorbent for CO₂ Capture

V. MEDRI¹, E. PAPA¹, E. LANDI¹, F. MICCIO¹, M. MINELLI², F. DOGHIERI², P. BENITO³, A. VACCARI³, ¹CNR-ISTEC, Faenza, Italy; ²Department 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:IL05 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. BARTELS¹, M. MAAS^{1,2}, K. REZWAN^{1,2}, ¹University of Bremen, Advanced Ceramics, Bremen, Germany; ²MAPEX 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 MOHALLEM¹, J. BATISTA DA SILVA², ¹Laboratory of Nanostructured Materials, UFMG, Brazil; ²CDTN/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-RUB¹, O. AL-KETAN¹, DONG-WOOK LEE¹, ALIA ABU ALI¹, R. REZGUI², R. ROWSHAN³, ¹Masdar Institute, Khalifa University of Science and Technology, Abu Dhabi, UAE; ²Core 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. BOTTI¹, M.D.M. INNOCENTINI², P. PASTORE³, L.R. SAN GREGORIO², P. COLOMBO¹, ¹Department of Industrial Engineering, University of Padova, Padova, Italy; ²Course of Chemical Engineering, University of Ribeirão Preto, Ribeirão Preto-SP, Brazil; ³Department 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. LALE¹, U.B. DEMIRCI², **S. BERNARD**¹, ¹Institut de Recherche sur les céramiques (IRCER) UMR 7315 CNRS-Centre Européen de la Céramique, Limoges Cedex, France; ²Institut 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}, ¹Fundación Agencia Aragonesa para la Investigación y Desarrollo (ARAID), Zaragoza, Spain; ²AENEAM Advanced Membrane Technologies S.L., Zaragoza, Spain; ³Fundación 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 Almería, Spain

CI-6:L08 Enzyme-modified Porous Ceramic Capillaries for Continuous Flow Hydrolysis of Proteins

M.M. HOOG ANTINK¹, T. SEWCZYK², S. KROLL³, S. BEUTEL², M. MAAS¹, K. REZWAN¹, ¹Advanced Ceramics, University Bremen, Bremen, Germany; ²Institute for Technical Chemistry, Leibniz University Hannover, Hannover, Germany; ³Institute 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. LANCELLOTTI¹, J. KIVENTERA², M. ILLIKAINEN², C. LEONELLI¹, ¹Department of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia, Modena, Italy; ²University 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 Tailored 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. PAUNOVIC¹, N. CVETKOVIC¹, G. LAZOVIC³, L. KOCIC¹, ¹University of Nis, Faculty of Electronic Engineering, Nis, Serbia; ²Institute of Technical Sciences of SASA, Belgrade, Serbia; ³University 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, Interdisciplinray 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. LICHTENSTEIGER¹, S. FERNANDEZ-PENA¹, C. WEYMANN¹, P. ZUBKO², P. PARUCH¹, J.-M. TRISCONI¹, ¹Department of Quantum Matter Physics, University of Geneva, Geneva, Switzerland; ²London 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. BOY¹, 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 WADA¹, T. AIZAWA¹, S. UENO¹, I. FUJII¹, N. KUMADA¹, C. MORIYOSHI², Y. KUROIWA², ¹Material Science and Technology, University of Yamanashi, Yamanashi, Japan; ²Department 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-xCaTi0.9Zr0.1O3 (x=0.10-0.18) Mixed Oxide Ceramics

A. REYES¹, M.E. VILLAFUERTE-CASTREJÓN¹, A. GARCÍA², A.M. GONZALEZ³, **L. PARDO**², ¹Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México, D.F. Mexico; ²Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), Cantoblanco, Madrid, Spain; ³CEMDATIC, 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. VOLKOVA¹, P. GEMEINER¹, J. GUILLOT², D. LENOBLE², N. CHAUVIN³, F. KAROLAK¹, C. BOGICEVIC¹, B. DKHIL¹, I.C. INFANTE³, ¹Laboratoire SPMS, CentraleSupélec, CNRS-UMR8580, Université Paris-Saclay, Gif-sur-Yvette, France; ²Luxembourg Institute of Science and Technology (LIST), Materials Research and Technology (MRT) Department, Belvaux, Luxembourg; ³Institut 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. NUZHNYI, 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. KWAMENI¹, M. RÖSSLE², M. REINAARDT¹, W. LEITENBERGER², F. ZAMPONI², M. ALEXE³, M.BARGHEER^{1,2}, ¹Helmholtz Zentrum Berlin, Berlin, Germany; ²Institute of Physics University of Potsdam, Germany; ³Department 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}, ¹Electronic Ceramics Department, Jozef Stefan Institute, Ljubljana, Slovenia; ²Jozef Stefan International Postgraduate School, Ljubljana, Slovenia

CJ-2:L20 Dead-layer Analysis in Ferroelectric Thin Films

A. SIGOV, Yu. PODGORNYY, 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 JEONG¹, GEON-TAE HWANG², WOON-HA YOON², SHASHANK PRIYA³, JUNGHO RYU², ¹Inha University, Incheon, South Korea; ²Korea Institute of Materials Science, South Korea; ³Pennsylvania 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, Université Paris-Saclay, Palaiseau, France; I. GROSS, W. AKHTAR, L.J. MARTINEZ, S. CHOUAIEB, V. JACQUES, Laboratoire Charles Coulomb, Université 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:IL07 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:IL08 Complex Functional Characterization of Percolative CoFe₂O₄-PbTiO₃ Composite Ceramics

C.E. CIOMAGA¹, M. AIRIMIOAEI², I. TURCAN², A.V. LUKACS², L. PADURARIU², S. BALCIUNAS³, J. BANYŠ³, L. MITOSERIU², ¹Research Department, Faculty of Physics, Dielectrics, Ferroelectrics & Multiferroics Group, Al. I. Cuza Univ. of Iasi, Iasi, Romania; ²Dielectrics, Ferroelectrics & Multiferroics Group, Faculty of Physics, "Al. I. Cuza" University of Iasi, Iasi, Romania; ³Faculty 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. FRÖMLING¹, J. RÖDEL¹, ¹Institute of Materials Science, Technische Universität Darmstadt, Darmstadt, Germany; ²Institute 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 SHIMANO¹, W. HARANO², T. OHYAMA², K. SUEMATSU¹, K. WATANABE¹, M. NISHIBORI¹, ¹Faculty of Engineering Sciences, Kyushu University, Fukuoka, Japan; ²Interdisciplinary 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:IL07 Narrow Band Gap Observed in Multicomponent Equitatomic Rare Earth Oxides

L. VELASCO¹, A. SARKAR^{1,2}, H. HAHN^{1,2,3}, ¹Institute of Nanotechnology, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany; ²Joint Research Laboratory Nanomaterials – Technische Universität Darmstadt and Karlsruhe Institute of Technology, Darmstadt, Germany; ³Helmholtz 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. SMITH¹, A.I. SAVVA¹, YONGQIANG WANG², J.P. WHARRY³, SOOYEON HWANG⁴, DONG SU⁴, D.P. BUTT⁵, **HUI XIONG**¹, ¹Micron School of Materials Science and Engineering, Boise State University, Boise, ID, USA; ²Ion Beam Materials Laboratory, Los Alamos National Laboratory, Los Alamos, NM, USA; ³School of Nuclear Engineering, Purdue University, West Lafayette, IN, USA; ⁴Center for Functional Materials, Brookhaven National Laboratory, Upton, NY, USA; ⁵College 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:IL04 Enhancement of Ionic Conductivity in Electric Field-assisted Pressureless Sintered Solid Electrolytes

R. MUCCILLO^{1,2}, ¹Center of Science and Technology of Materials, Energy and Nuclear Research Institute, S. Paulo, SP, Brazil; ²Center of Engineering, Modeling and Applied Social Sciences, Federal University of ABC, Santo André, SP, Brazil

CJ-5:IL05 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:IL06 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:IL07 Properties of Shape-controlled Gadolinia-doped Ceria Nanoparticles

M.F.S. MACHADO, L.P. R. MORAES, L.N. RODRIGUES, T. RODRIGUES, **F. CORAL NONSECA**, 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 Batteries

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:IL06 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:IL07 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 Científicas, 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. VARGINON¹, M.N. GRISOLIA¹, J. INIGUEZ², A. BARTHELEMY¹, M. BIBES¹, ¹Unité Mixte de Physique, CNRS, Thales, Université Paris Sud, Université Paris-Saclay, Palaiseau, France; ²Materials Research and Technology Department, Luxembourg Institute of Science and Technology (LIST), Esch/Alzette, Luxembourg

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:IL02 Magnon Study in (Y, Lu)MnO₃ System using Raman Spectroscopy

SEUNG KIM¹, JIYEON NAM¹, THI HUYEN NGUYEN¹, IN-SANG YANG¹, XUEYUN WANG², SANG-WOOK CHEONG², ¹Department of Physics, Ewha Womans University, Seoul, South Korea; ²Rutgers 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. RICCÌ**, 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:IL02 Nonlinear Spin-lattice Coupling in EuTiO₃: Novel Two-dimensional Magneto-optical Device for Light Modulation

A. BUSSMANN-HOLDER¹, J. KOHLER¹, K. ROLEDER², ¹Max-Planck-Institute for Solid State Research, Stuttgart, Germany; ²Institute of Physics, University of Silesia, Katowice, Poland

CK-5:IL03 Nanopillars with E-field Accessible Multi-state (N≥4) Magnetization with Giant Magnetization Changes in Self-assembled BiFeO₃-CoFe₂O₄/Pb(Mg_{1/3}Nb_{2/3})-38at%PbTiO₃ Heterostructures

XIAO TANG, JIEFANG LI, D. VIEHLAND, Dept. of Materials Science and Engineering, Virginia Tech, Blacksburg, VA, USA

CK-5:IL04 Observation of Metamagnetic Transition and Magnetoelectric Coupling in Acentric and Non-polar Pb₂MnO₄

K.D. CHANDRASEKHAR¹, H.C. WU¹, D.J. HSIEH¹, B.J. SONG¹, J.-Y. LIN², J.L. HER³, HUNG-DUEN YANG¹, ¹Department of Physics, National Sun Yat-sen University, Kaohsiung, Taiwan; ²Institute of Physics, National Chiao Tung University, Hsinchu, Taiwan; ³Division of Natural Science, Center for General Education, Chang Gung University, Tao-Yuan, Taiwan

CK-5:IL05 Origin of High Magnetoelectric Coupling in Multiferroic BiFeO₃-BaTiO₃ Superlattices

M. LORENZ¹, V. LAZENKA², C. PATZIG³, S. SELLE³, D. HIRSCH⁴, T. HÖCHE³, K. TEMST², M. GRUNDMANN¹, ¹Universität Leipzig, Felix-Bloch-Institut für Festkörperphysik, Semiconductor Physics Group, Leipzig, Germany; ²KU Leuven, Instituut voor Kern- en Stralingsfysica, Leuven, Belgium; ³Fraunhofer-Institut für Mikrostruktur von Werkstoffen und Systemen, Center for Applied Microstructure Diagnostics, Halle, Germany; ⁴Leibniz-Institut für Oberflächenmodifizierung e.V., Physikalische Abteilung, Leipzig, Germany

CK-5:IL06 Crystal and Magnetic Structure of Bi_{1-x}La_xFe_{1-y}Mn_yO₃ Ceramics

D.V. KARPINSKY^{1,2}, I.O. TROYANCHUK^{1,2}, M.V. SILIBIN¹, V.A. KHOMCHENKO³, ¹National Research University of Electronic Technology "MIET", Zelenograd, Moscow, Russia; ²Scientific-Practical Materials Research Centre of NAS of Belarus, Minsk, Belarus; ³CFisUC, 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 T_c Superconductor Interfaces

D. SANCHEZ-MANZANO¹, M. ROCCI¹, F.A. CUELLAR¹, M. VARELA¹, Z. SEFRIQUI¹, C. LEON¹, J. TRASTOY², X. PALERMO², V. ROUCO², J. VILLEGAS², M. GARCIA HERNANDEZ³, Q. WANG⁴, Y.H. LIU⁴, S.G.E. TE VELTHUIS⁴, M.R. FITZSIMMONS⁵, **J. SANTAMARIA**¹, ¹GFMC, Depto. Física de Materiales, Universidad Complutense de Madrid, Madrid, Spain; ²Unité Mixte de Physique CNRS/Thales, Campus de Polytechnique, Palaiseau and Université Paris-Sud, Orsay, France; ³Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), Cantoblanco. Madrid, Spain; ⁴Materials Science Division, Argonne National Laboratory, Argonne, IL, USA; ⁵Oak 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. BONFA¹, 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:IL03 Microstructural Evaluation of Magnetite Nanoparticles (Fe₃O₄) Synthesized by Different Routes

A. FERREIRA^{1,3}, L.B. SALVIANO², T.M.S. CARDOSO¹, G.C. SILVA³, ¹Department of Chemistry, Centro Federal de Educação Tecnológica de Minas Gerais (CEFET-MG), Belo Horizonte, MG, Brazil; ²Department of Materials Engineering, Centro Federal de Educação Tecnológica de Minas Gerais (CEFET-MG), Belo Horizonte, MG, Brazil; ³National 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. Física de Materiales, Universidad Autónoma de Madrid, Madrid, Spain; J.J. CARVAJAL, R. SOLE, M. AGUILO, F. DIAZ, Física 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. STRICCOLI¹, E. FANIZZA^{2,1}, A. PANNIELLO¹, N. DEPALO¹, M. CORRICELLI¹, C. INGROSSO¹, R. COMPARELLI¹, A. AGOSTIANO^{2,1}, M. L. CURRI¹, ¹CNR IPCF Bari c/o Chem. Dept., University of Bari, Bari, Italy; ²Chemistry 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 OKADA¹, F. CHICILLO², JUMPEI UEDA³, S. TANABE³, A. EDGAR⁴, G. BELEV², T. WYSOKINSKI⁵, D. CHAPMAN², T. YANAGIDA¹, S. KASAP², ¹Nara Institute of Science and Technology, Nara, Japan; ²University of Saskatchewan, Canada; ³Kyoto University, Japan; ⁴Victoria University of Wellington, New Zealand; ⁵Canadian 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 SPSe₂ 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, Estonia; Institute of Physics, Jan Długosz University, Częstochowa, Poland

CL-2:L06 Morphological, Photoluminescent and Structural Properties Study of Pr³⁺-Doped α -Ag₂WO₄ Synthesized by the Coprecipitation Methodology

I.L.V. ROSA¹, C.L. CORREA¹, I.M. PINATTI¹, R. ROMANCINI¹, E. LONGO^{1,2}, ¹CDMF, LIEC, Chem. Depart., Federal University of São Carlos (UFSCar), São Carlos, Brazil; ²CDMF, 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. CARAPPELLA, 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. GUZIK¹, M. BIEZA¹, E. TOMASZEWICZ², Y. GUYOT³, G. BOULON³, ¹Faculty of Chemistry, University of Wrocław, Wrocław, Poland; ²Department of Inorganic and Analytical Chemistry, West Pomeranian University of Technology, Szczecin, Poland; ³Univ Lyon, Université Claude Bernard Lyon1, CNRS, Institut Lumière Matière, Villeurbanne, France

CL-3:L04 Spark Plasma Sintering (SPS) of Alumina-based Transparent Ceramics

A. PILLE¹, A. KANAEV¹, T. BILLETON², E. FELDBACH³, F. SCHOENSTEIN¹, ¹Laboratoire de Sciences des Procédés et des Matériaux, CNRS UPR-3407, Université Paris 13, Sorbonne Paris Cité, Villetaneuse, France; ²Laboratoire de Physique des Lasers, CNRS UMR-7538, Université Paris 13, Sorbonne Paris Cité, Villetaneuse, France; ³Institute of Physics, University of Tartu, Tartu, Estonia

Session CL-4

Laser Materials

CL-4:IL01 Optical Ceramics for High Energy Lasers

J. SANGHERA¹, W. KIM¹, G. VILLALOBOS¹, S. BAYYA¹, C. BAKER¹, M. HUNT¹, B. SHAW¹, J. FRANTZ¹, B. SADOWSKI², R. MIKLOS², L. BUSSE¹, D. BOYD¹, I. AGGARWAL², C. ASKINS¹, J. MYERS¹, J. PEELE², D. RHONEHOUSE¹, R. THAPA², S. BOWMAN¹, ¹Naval Research Laboratory, Optical Science Division, Washington, DC, USA; ²Sotera 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- μ m Solid State Lasers

JUN WANG^{1,2}, YONGGUANG ZHAO¹, DANLEI YIN^{2,3}, PENG LIU¹, JIE MA^{1,2}, YING WANG^{1,3}, DEYUAN SHEN¹, ZILI DONG³, LING BING KONG³, DINGYUAN TANG¹, ¹Jiangsu Key Laboratory of Advanced Laser Materials and Devices, School of Physics and Electronic Engineering, Jiangsu Normal University, Xuzhou, China; ²School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore; ³School 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. MOSKALEV², M.S. MIROV², S. VASILYEV², V.V. FEDOROV^{1,2}, D.V. MARTYSHKIN^{1,2}, O. GAFAROV¹, V. SMOLSKI², ¹Center for Optical Sensors and Spectroscopies and the Department of Physics, University of Alabama at Birmingham, CH 310, Birmingham, AL, USA; ²IPG 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. YIN¹, P. LIU², J. MA^{1,2}, Z.L. DONG³, L.B. KONG³, **DINGYUAN TANG^{1,2}**, ¹School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore; ²Jiangsu Key Laboratory of Advanced Laser Materials and Devices, Jiangsu Normal University, China; ³School 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 Fiberoptics

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. ZANI³, A. TAGLIAFERRI^{2,3}, 1CNR-IFN, Milano, Italy; ²CNST@Polimi, IIT, Milano, Italy; ³Department 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 LI¹, RAN ZOU¹, MOHAN WANG¹, SHENG HUANG¹, MING-JUN LI², M. BURIC³, P. OHODNICKIC³, **KEVIN P. CHEN**¹, ¹Department of Electrical and Computer Engineering, University of Pittsburgh, Pittsburgh, PA, USA; ²Corning Incorporated, Corning, NY, USA; ³National 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. TOBALDI¹, L. GRAZIANI², B FIGUEIREDO³, M.N. CAPELA¹, R. SILVA³, L. HENNETIER⁴, V ABRANTES⁵, P. FERREIRA⁵, M.P. SEABRA¹, E. QUAGLIARINI², J.A. LABRINCHA¹, ¹Department of Materials and Ceramics Engineering/CICECO - Aveiro Institute of Materials, University of Aveiro, Campus Universitário de Santiago, Aveiro, Portugal; ²Polytechnic University of Marche, Department of Civil and Building Engineering and Architecture, Ancona, Italy; ³Graphenest, S.A., Lugar da Estação, Edifício Vouga Park, Paradelo do Vouga, Portugal; ⁴Technological Center for Ceramic and Glass Industries, CTCV, Coimbra, Portugal; ⁵RECER, 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. VODIŠEK², A. ŠULIGOJ^{1,3}, ¹University of Ljubljana, Faculty of Chemistry and Chemical Technology, Ljubljana, Slovenia; ²University of Nova Gorica, Nova Gorica, Slovenia; ³National 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. Rostislav Kaishev", Bulgarian Academy of Sciences, Sofia, Bulgaria

CM-2:IL04 Waste Recycling in Clay Bricks

C.M.F. VIEIRA¹, L. FONSECA AMARAL¹, S.N. MONTEIRO², ¹State University of the Northern Rio de Janeiro, UENF, Advanced Materials Laboratory, LAMAV, Campos dos Goytacazes, RJ, Brazil; ²Military 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-CASAS¹, C. MUGONI², C. SILIGARDI², A.A. ZALDIVAR-CADENA¹, E.I. CEDILLO-GONZÁLEZ¹, J.J. RUIZ-VALDÉS¹, A.I. SÁNCHEZ-VÁZQUEZ¹, ¹Universidad Autónoma de Nuevo León, Facultad de Ciencias Químicas, San Nicolás de los Garza, N.L., Mexico; ²Università 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. BARBIERI², F. ANDREOLA¹, R.D. FARIAS², C. MARTÍNEZ GARCÍA², I. LANCELLOTTI¹, T. COTES PALOMINO², ¹Department of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia, Modena, Italy; ²Department 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 Garavito, 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. HOTZA¹, M. DAL BO², ¹Department of Chemical Engineering (EQA), Federal University of Santa Catarina (UFSC), Florianópolis, SC, Brazil; ²Federal 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. VUCETIC¹, **J. RANOGAJEC**¹, H. HIRSENBERGER², A. VIDAKOVIC¹, S. MARKOV¹, ¹University of Novi Sad, Faculty of Technology, Novi Sad, Serbia; ²University of Novi Sad, Faculty of Technical 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. CONTE¹, C. ZANELLI¹, M. ADIT², G. CRUCIANI², M. DONDI¹, ¹CNR-ISTEC, Faenza Italy; ²Department 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. PALACIOS¹, P. BOWEN², F. PUERTAS¹, ¹Eduardo Torroja Institute for Construction Science (IETcc-CSIC), Madrid, Spain; ²École 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. HENPRASIRTAE, 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, Chulalongkorn 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 CO_x Argillite

C. DUPUY^{1,2}, A. GHARZOUNI², N. TEXIER-MANDOKI¹, X. BOURBON¹, S. ROSSIGNOL², ¹Agence nationale pour la gestion des déchets radioactifs (Andra), Chatenay-Malabry Cedex, France; ²Science des Procédés Céramiques et des Traitements de Surface (SPCTS), Centre Européen de la Céramique, Limoges Cedex, France

CM-5:L14 Synthesis of a New Geopolymer Based on Moroccan Pozzolana

A. AZIZ¹, I.-E. EL AMRANI EL HASSANI¹, A. ELBOUARI², C. SADIK², ¹Laboratory Physicochemistry of Applied Materials / Faculty of Sciences Ben M'sik; ²Laboratory 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
REFRATORIES: 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, Almatix 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:IL04 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 BILBAO¹, M. DOMBROWSKI¹, R. MICHEL¹, M. RAMZI AMMAR¹, A. CAZINARES¹, H. PILLIERE², P. SIMON¹, J. POIRIER¹, ¹CEMHTI CNRS Univ. Orleans, Orleans, France; ²Thermo Fisher Scientific Inel, France

CN-2:IL03 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:IL04 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:IL05 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. PAGLIOSA¹, V.C. PANDOLFELLI², ¹MAGNESITA S.A., Contagem, Brazil; ²Federal 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. HARMUTH¹, Y. DAI², D. GRUBER¹, S. JIN¹, ¹Montanuniversitaet Leoben, Leoben, Austria; ²Wuhan University of Science and Technology, Wuhan, China

CN-4:IL02 Thermo-chemo-mechanical Modelling of Refractories at High Temperatures: Basics, Keyoints and New Numerical Developments

E. BLOND¹, A.K. NGUYEN^{1,2}, T. SAYET¹, E. DE BILBAO³, A. BATAKIS², M.-D. DUONG⁴, ¹Université d'Orléans, LaMé, Polytech Orléans, Orléans, France; ²Université d'Orléans, MAPMO, UMR CNRS 6628, Orléans, France; ³Université d'Orléans, CEMHTI, UPR CNRS 3079, Orléans, France; ⁴University of Science, Hochiminh city, Nguyen Van Cu, Vietnam

CN-4:IL03 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:IL02 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:IL03 MgO Refractory Wear in the Ferrovandium 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 Céramique, Limoges, France

CN-5:IL06 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. BOUCHETOU¹, E.S. FOTSO, O. JOUBERT⁴, C. VARONA⁵, D. GOEURIOT², J. POIRIER¹, ¹CNRS, CEMHTI UPR 3079, Univ. Orléans, Orléans, France; ²LGF CNRS UMR 5307, Mines Saint-Etienne, France; ³CARRD, Imerys, Villach, Austria; ⁴Imerys Refractory Minerals Clerac; ⁵Bony 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-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, ZHENG YI 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-CHOUVY¹, B. THOMAS², I. LUCAS¹, M.M.T. TRAN¹, A. VEILLERE², J.-M. HEINTZ², J.-F. SILVAIN², ¹Laboratoire Interfaces et Systèmes Electrochimiques, LISE - UMR 8235, Sorbonne Universités, UPMC Univ Paris 06, CNRS, Paris, France; ²Institut 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 Pre ceramic Prepreg Production and use to produce low cost CMCs

C. MINGAZZINI, F. MAZZANTI, M. SCAFFI 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

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

Session CO-2

Interfaces / Interphases

CO-2:IL01 Active Metal Brazing of Composites for Thermal Management Applications

R. ASTHANA¹, M. SINGH², N. SOBCZAK³, J.J. SOBCZAK³, ¹University of Wisconsin-Stout, Menomonie, Wisconsin, USA; ²Ohio Aerospace Institute, Cleveland, OH, USA; ³Foundry 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},
¹State Key Laboratory of High Performance Ceramics and Superfine Microstructure; ²Structural Ceramics and Composites Engineering Research Center Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, P.R. China; ³Graduate 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

ZHENG YI 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 Technology 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 UHTCCs Produced by EPD and Sintering

S. FAILLA^{1,2}, L. ZOLI¹, P. GALIZIA¹, D. SCITI¹, ¹CNR-ISTEC, Faenza, Italy; ²University of Parma, Italy

CO-4:L05 Low Temperature Spark Plasma Sintering of TiB₂ Ceramics with High-entropy Alloy as Sintering Aid

WEI JI, ZHENG YI 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; **VI. 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}, ¹Institut de Chimie de la Matière Condensée de Bordeaux (ICMCM), CNRS, Pessac, France; ²Department of Electrical and Computer Engineering, University of Nebraska-Lincoln, Lincoln, NE, USA; ³DGA/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:L03 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 YANG¹, XUEYING WANG¹, LI AP², LILI ZHAO¹, YONGPING ZHU¹, ¹State Key Laboratory of Multiphase Complex System, Institute of Process Engineering, Chinese Academy of Sciences, Beijing, P.R. China; ²Science and Technology on Scramjet Laboratory, Beijing, P.R. China

CA:P02 Synthesis of α -cordierite Powder 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 $\gamma + \alpha$ -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 JHUANG¹, YUO-TERN TSAI², **KUAN-HONG LIN¹**, ¹Department of Mechanical Engineering, Tunghan University, New Taipei City, Taiwan; ²Department 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. PARSİ, 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 Politècnica 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 MOMOSE¹, YUTA SEGAWA¹, TAKAYUKI MUROSAKI², YUJI HIRAI¹, YASUYUKI NOGATA³, MASATSUGU SHIMOMURA¹, ¹Chitose Institute of Science and Technology, Bibi, Chitose, Japan; ²Asahikawa Medical University, Asahikawa, Japan; ³Central 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. PROKOFEV, 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 (Ti_{0.5}Zr_{0.5})₃AlC₂

D.YU. KOVALEV, S.V. KONOVALIKHIN, M.A. LUGININA, S.G. VADCHENKO, A.E. SYTSHEV, 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 NOGUEIRA¹, M. SOUSA DA SILVA GONDIM², P. SANTANA LEMOS³, M. DE ASSIS³, E. LONGO³, E.R. LEITE⁴, ¹Department of Physics, Federal University of Amazonas - UFAM, Brazil; ²Federal Institute of Education, Science and Technology of Maranhão - IFMA, Brazil; ³LIEC, Federal University of São Carlos - UFSCar, Brazil; ⁴LNNANO, 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 Presbyterian 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 Politècnica 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. REZAEI, 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. SEDLAK¹, A. KOVALCIKOVA¹, J. BALKO¹, P. RUTKOWSKI², A. DUBIEL³, E. MUDRA¹, V. GIRMAN⁴, J. DUSZA¹, ¹Institute of Materials Research, Slovak Academy of Sciences, Division of Ceramic and Non-Metallic Systems, Košice, Slovak Republic; ²AGH University of Science and Technology in Krakow, Faculty of Materials Science and Ceramics, Krakow, Poland; ³The Institute of Advanced Manufacturing Technology, Krakow, Poland; ⁴Pavol 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. LABED¹, D. NIBOU², M. OUDAH¹, B. IDIR¹, ¹Research Center in Industrial Technologies CRTI ex CSC, Chéragua, Algeria; ²University of Science and Technology Houari Boumedine, El Alia, Algeria, Algeria

CC:P03 Corrosion Protection of Ceramics Using Carbon-silver Film

A.A. VIEIRA¹, A.C. SENE¹, M.A. RAMIREZ¹, P.A. RADI^{1,2}, S.F. SANTOS³, J.V.C. SOUZA³, L.VIEIRA^{1,2}, ¹University of Paraíba Valley-UNIVAP/IP&D, São José dos Campos, SP-Brazil; ²Aeronautics Institute of Technology, ITA / LPP, São José dos Campos, SP-Brazil; ³São 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

L.A. MANFROI¹, M.A. RAMIREZ¹, P.A. RADI^{1,2}, L.VIEIRA^{1,2}, ¹Instituto de Pesquisa e Desenvolvimento-IPD/UNIVAP, São José dos Campos, SP-Brazil; ²Instituto Tecnológico de Aeronáutica, ITA/LPP, São José dos Campos, SP-Brazil

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 AURICCHIO¹, O.R. BAGNATO¹, P.R. MEI², ¹Brazilian Synchrotron Light Laboratory, Campinas, SP, Brazil; ²Faculty of Mechanical Engineering, Campinas, SP, Brazil

CD:P06 Brazing Vacuum Ceramic Tubes for Magnets Applications

O.R. BAGNATO¹, R.F. FRANCISCO¹, A.L. GOBBI², T. FALVO³, D.Y. KAKIZAKI^{1,4}, ¹Brazilian Synchrotron Light Laboratory, Campinas, SP, Brazil; ²Brazilian Nanotechnology National Laboratory - LNNano; ³Engecer Ltda, Brazil; ⁴Universidade Sao Francisco

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. SOLIS¹, A. BRITO¹, E. NAVARRETE-ASTORGA¹, E.A. DALCHIELE², D. LEINEN¹, J.R. RAMOS-BARRADO¹, **F. MARTIN**¹, ¹Laboratorio de Materiales y Superficies, Departamentos de Física Aplicada & Ingeniería Química, Universidad de Málaga, Málaga, Spain; ²Instituto 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-xTi_{1-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 AgPb₂SbTe₂ by Optimizing Spark Plasma Sintering Temperature

JUN PEI¹, BO-PING ZHANG¹, JING-FENG LI², DOU-DOU LIANG¹, ¹The Beijing Municipal Key Laboratory of New Energy Materials and Technologies, School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China; ²State 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 ZHANG¹, LI-JUN ZHENG^{1,2}, HE-ZHANG LI¹, JUN PEI¹, JIA-BING YU³, ¹The Beijing Municipal Key Laboratory of New Energy Materials and Technologies, School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, China; ²School of High Temperature Materials and Magnesite Resources Engineering, University of Science and Technology Liaoning, Anshan, China; ³Department 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, Sicheung-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. POURMOHAMMADI VAFA, University 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. ZHANG¹, G. HUG², ¹Harbin Institute of Technology, Harbin, China; ²LEM 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

L. NAVARRO¹, P. CARPIO¹, M.D. SALVADOR¹, R. MORENO², ¹Instituto de Tecnología de Materiales (ITM), Universitat Politècnica de València (UPV), Valencia, Spain; ²Instituto de Cerámica y Vidrio (ICV), Consejo Superior de Investigaciones Científicas (CSIC), Madrid, Spain

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. SENE¹, T. BAESSO¹, L.A. MANFROI¹, A.A. VIEIRA¹, P. A. RAD^{1,2}, L.C. SANT'ANA DA CRUZ¹, B.F. CAMELO¹, M.A. RAMIREZ¹, L.VIEIRA^{1,2}, ¹Universidade do Vale do Paraíba- UNIVAP/ IP&D, Sao Jose dos Campos, SP-Brazil; ²Instituto 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. PFLITSCH¹, B. ATAKANA⁴, ¹Thermodynamics, IVG, Mechanical Engineering, University of Duisburg-Essen, Campus Duisburg, Duisburg, Germany; ²University of Oran 1- Ahmed Ben Bella, Laboratory of Physics of Thin Films and Materials for Electronics, ELM Naouer, Oran, Algeria; ³University Centre Belhadj Bouchaib of Ain-Temouchent, Institute of science and technology, Algeria; ⁴CeNIDE, Center for Nanointegration Duisburg-Essen, Germany

CH:P10 Synthesis and Studies on YPSZ and Rare-earth Zirconate Pyrochlore Multilayered TBCs

K.T. PASUPULETI¹, P. RAMASWAMY¹, N. MURTHY SVS², ¹Mechanical Engineering, Faculty of Engineering, Christ University, Bangalore, India; ²Vikram 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
X.A. WALTER¹, I. GAJDA¹, T. OBATA¹, U. VOGT², J. GREENMAN¹, I. IEROPOULOS¹, ¹Bristol BioEnergy Centre, Bristol Robotics Laboratory, University of the West of England, UK; ²Empa, Material Science and Technology, Laboratory of Materials for Energy Conversion, Dübendorf, Switzerland

CI:P08 Thermal and Physical Characterization of Composite Materials based on Plaster
S. BOUZIT¹, M. TAHA¹, S. LAASRI², L. BOURDEN¹, ¹Faculty of Sciences, University of Ibn Zohr, Agadir, Morocco; ²ENSA, University Chouaib Doukkali, El Jadida, Morocco

CI:P09 Improvement of the Clay Bentonite Catalytic Properties Aiming its Use as Heterogeneous Catalysts in the biodiesel Production
D.S. MARINS, A.G. ADAMCZEWSKI, A.V. CHAVES DE ANDRADE, E.C. FERREIRA DE SOUZA, S.R. MASETTO ANTUNES, **M.E. PAYRE 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 (Na_{0.53}K_{0.47})(Nb_{1-x}Tax)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, Chonju 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 Magnetolectric Composites Obtained by the SPS Method
C.E. CIOMAGA¹, M. AIRIMIOAEI², A. GUZU², N. HORCHIDAN^{2,3}, L.P. CURECHERIU², N. LUPU⁴, F.M. TUFESCU^{1,3}, **L. MITOSERIU²**, ¹Research Department, Faculty of Physics, Dielectrics, Ferroelectrics & Multiferroics Group, Al. I. Cuza Univ. of Iasi, Iasi, Romania; ²Dielectrics, Ferroelectrics & Multiferroics Group, Department of Physics, Al. I. Cuza Univ. of Iasi, Iasi, Romania; ³GRADIENT Srl., Iasi, Romania; ⁴National 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. SILIBIN¹, V.S. BYSTROV^{1,2}, D. KARPINSKY^{1,3}, P. MIRZADEH⁴, P.A.A.P. MARQUES⁴, N. NASANI⁴, G. GONCALVES⁴, B.A. SINGH⁴, I.K. BDIKIN^{1,4}, ¹National Research University of Electronic Technology, Shokina Square, Building 1, Zelenograd, Moscow, Russia; ²Inst. Mathematical Problems of Biology, Keldysh Institute of Applied Mathematics RAS, Pushchino, Moscow region, Russia; ³Scientific-Practical Materials Research Centre of NAS of Belarus, Minsk, Belarus; ⁴TEMA-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. BOLLO¹, D. RUIZ², ¹Universidad de Chile, Santiago, Chile; ²Universidad 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 Ba_{1-x}CaxZrO₃ (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 RAN¹, **JUNG HYUN JEONG¹**, KIWAN JANG², HO SUEB LEE², ¹Department of Physics, Pukyong National University, Busan, South Korea; ²Department 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 Wastes Treated 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, Florianópolis, 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. Rostislav 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. SIERRAS, 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

E. BENAVIDEZ, Facultad Regional San Nicolás - UTN, San Nicolás, Argentina; A. SCHANZLE, N. BELLANDI, Magnesita Refractorios Argentinos, San Nicolás, Argentina

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

QINSONG MA, T.H. XU, CFC Key Laboratory, National University of Defense Technology, Changsha, P.R. China