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14. ABSTRACT
Armor Ceramics Symposium 2016

40th International Conference on Advanced Ceramics and Composites
Organized by The American Ceramic Society
Daytona Beach, FL - January 24-29, 2016

15. SUBJECT TERMS
Ceramic, Ceramics, Armor, Transparent, Modeling, Characterization, Processing, Ballistic Behavior, Glass

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a. REPORT	b. ABSTRACT	c. THIS PAGE			Andrew Wereszczak
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Report Title

Final Report: Support for the Armor Ceramics symposium at the 40th International Conference on Advanced Ceramics and Composites.

ABSTRACT

Armor Ceramics Symposium 2016

40th International Conference on Advanced Ceramics and Composites
Organized by The American Ceramic Society
Daytona Beach, FL - January 24-29, 2016

Symposium Chair: Jerry LaSalvia, US Army Research Lab
Principle Investigator for ARO Funding: Andy A. Wereszczak, ORNL

SUMMARY

The success of the Ceramic Armor Materials by Design symposium at Pack Rim IV International Conference on Advanced Ceramics and Glasses in November 2001 coupled with the U.S. military actions in response to the September 11, 2001 terrorist attacks were two of the reasons for creating an annual symposium on armor ceramics. Furthermore the success of the Pac Rim symposium showed the need for an annual unclassified gathering focused on the challenges related to the development, identification and fabrication of armor ceramics. Prior to November 2001 the vast majority of meetings were classified with restrictions on who could attend. The primary objective of the Armor Ceramics Symposium is to provide an annual forum for the presentation and discussion of unclassified information and ideas pertaining to the development, optimization, and evaluation of ceramic materials for armor applications. It was determined that the maximum benefit of such a symposium would be realized by holding it in conjunction with the annual International Conference and Exposition on Advanced Ceramics and Composites organized by the Engineering Ceramics Division of the American Ceramic Society.

In 2002 a committee was formed to organize a focused session entitled “Topics in Ceramic Armor”. This first session was held in January 2003 and consisted of 32 oral and poster presentations covering the areas of Novel Material Concepts, Dynamic Testing and Modeling, and Transparent Ceramics. On average 100-125 people were in attendance throughout this day and a half session. Within three years this session evolved into an international 2-day symposium with over 60 oral and poster presentations and an average daily attendance of approximately 140 people. Presently the symposium is now 2.5 days in length and annually has over 70 presentations including international presentations from scientists and engineers from England, Japan, Sweden, Israel, Germany, Japan and Korea.

HOW THIS SYMPOSIUM RELATES TO THE RESEARCH INTEREST TO THE US ARMY

The Army’s primary goal is to provide its soldiers with the equipment to do their job and return home safely. A strategic element of the future success of the US military against a myriad of potential threats is the performance of armor systems for air and ground vehicles as well as the individual soldier. Ceramic materials are currently used in many armor systems and they will be integral components of future systems. This symposium continues the search for novel material concepts and the development of valid armor design and characterization tools to predict performance.

The 2016 symposium included the following proposed sessions:
- Developments in Transparent and Glass Research
- Developments in Synthesis and Processing
- Developments in Materials and Process Modeling
- Developments in Materials Characterization, Properties, and Response
- Developments in Ballistic Behavior

RESULTS

The Armor Ceramics Symposium was held January 24-29, 2016 in Daytona Beach, FL as part of the 40th International Conference & Exposition on Advanced Ceramics and Composites. The 14th edition of this symposium consisted of 45 oral and poster presentations on the symposium topics listed above. The symposium continues to foster discussion and collaboration between academic, government and industry personnel from around the globe. A peer reviewed proceedings was published that included 14 papers from this symposium. The papers were published in The American Ceramic Society’s Ceramic Engineering and Science Proceedings (see citation below) and is available via John Wiley & Sons (www.wiley.com/go/ceramics).

Ceramic Engineering and Science Proceedings, Volume 37, Issue 4; Advances in Ceramic Armor, Bioceramics, and Porous Materials; Jerry LaSalvia, Roger Narayan, and Paolo Colombo, Editors, 2016, The American Ceramic Society

Enter List of papers submitted or published that acknowledge ARO support from the start of the project to the date of this printing. List the papers, including journal references, in the following categories:

(a) Papers published in peer-reviewed journals (N/A for none)

Received Paper

TOTAL:

Number of Papers published in peer-reviewed journals:

(b) Papers published in non-peer-reviewed journals (N/A for none)

Received Paper

TOTAL:

Number of Papers published in non peer-reviewed journals:

(c) Presentations

40th International Conference and Exposition on Advanced Ceramics and Composites
January 24 - 29, 2016

Armor Ceramics Sessions

Monday, January 25, 2016
Time Session or Event Info
1:20 PM-3:20 PM, Coquina Salon E, Developments in Transparent and Glass Research, Oral, S4: Armor Ceramics, Chair: Jerry LaSalvia, jerry.c.lasalvia.civ@mail.mil, Army Research Laboratory; Chair: Steve Kilczewski, steven.m.kilczewski.ctr@mail.mil, Army Research Laboratory

1:30-2:00 PM
ICACC-S4-001-2016. Understanding Structure and Fracture Behavior of Glass from Its Elastic Response L. Huang
2:00-2:30 PM
ICACC-S4-002-2016. Nano-Ductility in Silicate Glasses is Driven by Topological Heterogeneity B. Wang; Y. Yu; M. Wang; J.C. Mauro; M. Bauchy
2:30-3:00 PM ICACC-S4-003-2016. Gelcasting of transparent ceramics J. Klimke

3:20 PM-6:00 PM, Coquina Salon E, Developments in Synthesis and Processing I, Oral, S4: Armor Ceramics, Chair: Lionel Vargas, lionel.r.vargas-gonzalez.civ@mail.mil, ARL
3:20-3:50 PM Abstract Withdrawn
3:50-4:20 PM
ICACC-S4-005-2016. Additive Manufacturing of Advanced Ceramic Components: What is possible today and what are the trends? T. Moritz; H. Richter; U. Scheithauer; M. Ahlhelm; E. Schwarzer; A. Michaelis
4:20-4:40 PM
ICACC-S4-006-2016. Optimization of Boron Carbide Ceramic Suspension Gels (CeraSGels) for Room Temperature Robocasting W.J. Costakis; A. Diaz Cano; L. Rueschhoff; A. McEachen; R. Trice; J. Youngblood
4:40-5:00 PM
ICACC-S4-007-2016. Room-temperature injection molding of boron carbide suspensions A. Diaz Cano; J. Youngblood; R. Trice
5:00-5:20 PM
ICACC-S4-008-2016. Further Results on the Densification and Microstructure of Boron Carbide Utilizing Al- and Si-Based Additives K.D. Behler; J. LaSalvia; P.E. O'Shannessy; K.A. Kuwelkar; S.D. Walck

Tuesday, January 26, 2016
8:00 AM-11:00 AM, Coquina Salon E, Developments in Synthesis and Processing II, Oral, S4: Armor Ceramics, Chair: Victoria Blair, victoria.blair17@gmail.com, US Army Research Laboratory
8:00-8:20 AM
ICACC-S4-042-2016. Phenomenological Mechanochemistry of Fracture of Polarizable Solids M. Greenfield
8:40-9:00 AM
ICACC-S4-013-2016. Tailored Interface Controlled Layered B4C Ceramic Tiles Produced by Field Assisted Sintering Technology (FAST) for Body Armor Applications J. Singh
9:00-9:20 AM
ICACC-S4-014-2016. Effect of Alumina and Silica Additives on the Densification Behavior of Hot-Pressed Boron Suboxide E.R. Shanholtz; P.E. O'Shannessy; J. LaSalvia; K. Behler; K.A. Kuwelkar
9:40-10:00 AM
ICACC-S4-016-2016. Dissolution of excess alumina into single phase magnesium aluminate spinel J.A. Miller; I.E. Reimanis; W. Miao
10:00-10:20 AM Break

10:20-10:40 AM
ICACC-S4-017-2016. Multi-layer ceramic armors from bio inspired, structural templates G. Smith; G. Dwivedi; S. Sampath
10:40-11:00 AM
ICACC-S4-018-2016. Novel Processing of Metal-Ceramic Interfaces through Ultrasonic Additive Manufacturing J. Sietins; B. McWilliams
11:00 AM-12:00 PM, Coquina Salon E, Developments in Materials and Process Modeling I, Oral, S4: Armor Ceramics, Chair: Nitin Daphalapurkar, ndaphal1@jhu.edu, The Johns Hopkins University
11:00-11:20 AM
ICACC-S4-019-2016. Computational Implementation of Anisotropic damage failure in brittle materials R. Ayyagari Venkata S; D. Mallick; N. Daphalapurkar; A. Tonge; K. Ramesh
11:20-11:40 AM
ICACC-S4-020-2016. A multi-scale model for dynamic failure of ceramics based on efficiently binned flaw populations F. Huq; L. Graham-Brady
11:40-12:00 PM
ICACC-S4-021-2016. Prediction of Raman Spectra and Shear Resistance of Boron Carbide using Density Functional Perturbation Theory C. Kunka; A. Awasthi; G. Subhash
1:20 PM-1:40 PM, Coquina Salon E, Developments in Materials and Process Modeling II, Oral, S4: Armor Ceramics, Chair: Nitin Daphalapurkar, ndaphal1@jhu.edu, The Johns Hopkins University
1:20-1:40 PM
ICACC-S4-022-2016. The Origin of Brittle Failure of Boron Carbide from First Principles Based Multiscale Simulations Q. An; W.A. Goddard
1:40 PM-5:20 PM, Coquina Salon E, Developments in Materials Characterization, Properties, and Response I, Oral, S4: Armor Ceramics, Chair: Jerry LaSalvia, jerry.c.lasalvia.civ@mail.mil, Army Research Laboratory
1:40-2:00 PM
ICACC-S4-023-2016. Investigation of the Structural and Physical Properties of Boron Carbide Across the Solubility Range K.A. Kuwelkar; K. Behler; V. Domnich; R.A. Haber
2:00-2:20 PM
ICACC-S4-024-2016. Transmission Electron Microscopy of Amorphization Band Structure due to Rate-Dependent Indentation on Micro- and Nano-Grained Boron Carbide G. Subhash; P. Jannotti; M. DeVries; J. Pittari
2:20-2:40 PM
ICACC-S4-025-2016. Analysis of mechanical properties distribution in a hot-pressed boron carbide L. Farbaniec; J.D. Hogan; M. Shaeffer; K. Ramesh
2:40-3:00 PM
ICACC-S4-026-2016. The effect of grain size on the indentation size effect in boron carbide and silicon carbide C. Besnard; N. Al Nasiri; W. Montague; P. Brown; F. Giuliani; L. Vandeperre

3:20-3:40 PM ICACC-S4-027-2016. Compression strength of boron carbide J. Swab
3:40-4:00 PM
ICACC-S4-044-2016. Directional Amorphization of Boron Carbide Subjected to Nanosecond Laser Energy Deposition S. Zhao
4:00-4:20 PM
ICACC-S4-029-2016. Characterizing Armor Ceramic Microstructures Non-Destructively Through Their Electrical Properties M. Golt; K. Strawhecker; M. Bratcher; E. Warner
4:20-4:40 PM
ICACC-S4-030-2016. Comparison of Amorphized Zones Beneath Static and Dynamic Indentations in Boron Carbide G. Parsard; G. Subhash
4:40-5:00 PM
ICACC-S4-031-2016. Dynamic Electromechanical Behavior of

Ferroelectric Ceramics in the Morphotropic Phase Boundary L.E. Lamberson; L. Shannahan
5:00-5:20 PM
ICACC-S4-032-2016. The Influence of Impurities on Alumina Microstructure R. Moshe; W.D. Kaplan
5:30 PM-8:00 PM, Ocean Center Arena, Poster Session A, Poster, Posters
5:30 PM-8:00 PM
ICACC-FS2-P001-2016. Consolidation and characterization of calcium lanthanum sulfide infrared optical materials Y. Li; Y. Wu
5:30 PM-8:00 PM
ICACC-FS2-P003-2016. Development of Low Temperature Glass Systems for High Efficiency Lighting Devices J. Liao; Y. Chung; F. Wu
5:30 PM-8:00 PM
ICACC-FS2-P004-2016. Stability of Semiconductor Core Optical Fibers J. Guo; M. Ordu; J. Bird; S. Ramachandran; S. Basu
5:30 PM-8:00 PM
ICACC-S1-P005-2016. Shear/tensile tests on joined glass-to-steel components M. Ferraris; S. Delapierre; T. Scalici; A. Valenza; C. Fichera; M. Avalle
5:30 PM-8:00 PM
ICACC-S1-P006-2016. Joining of Cf/SiC ceramic composite to itself and TI64 for aerospace applications P. Gianchandani; M. Bangash; V. Casalegno; M. Ferraris
5:30 PM-8:00 PM
ICACC-S1-P007-2016. Long Term Durability Results From Ceramic Matrix Composites: Comparison Across Multiple Material Systems G. Ojard; A. Calomino; B. Flandermeyer; J. Brennan; D. Jarmon; D. Brewer
5:30 PM-8:00 PM
ICACC-S1-P008-2016. Influence of Curvature on High Velocity Impact of SiC/SiC Composites R. Mansour; M. Kannan; M. Presby; G. Morscher; F. Abdi; C. Godines; J. Shi; S. Choi
5:30 PM-8:00 PM
ICACC-S1-P009-2016. Si3N4-based Ceramics Fabricated with a Mixture of Si3N4-Si Powders R. Huang; Y. Wu; S. Ye; Y. Long; H. Lin
5:30 PM-8:00 PM
ICACC-S1-P010-2016. High temperature electrical behavior of meltinfiltrated SiC/SiC composites M.P. Appleby; G. Morscher; D. Zhu; E. Maillet
5:30 PM-8:00 PM
ICACC-S1-P011-2016. Creep Properties of Lutetium Oxide Containing SiAlON Ceramics D. Turan
5:30 PM-8:00 PM
ICACC-S1-P012-2016. The effect of BN volume fraction on BN particle dispersion SiC composites S. Yanagawa; T. Hinoki; K. Shimoda
5:30 PM-8:00 PM
ICACC-S1-P013-2016. Experimental verification of continuum damage mechanics model for SiC/SiC composites using digital image correlation technique S. Ogihara; T. Kikuta; R. Maeno; T. Aoki; T. Ogasawara; R. Kitamura
5:30 PM-8:00 PM
ICACC-S1-P014-2016. Degradation evaluation of Si3N4 ceramic surface in contact with molten aluminum by using microcantilever beam specimens S. Fujita; J. Tatami; M. Iijima
5:30 PM-8:00 PM
ICACC-S1-P015-2016. Modified asymmetric four-point bend test method for in-plane shear properties of ceramic matrix composites at elevated temperatures I. Hisato; M. Takanashi; T. Nakamura; T. Aoki; T. Ogasawara
5:30 PM-8:00 PM
ICACC-S1-P021-2016. Development of transthickness tension test

method for ceramic matrix composites at elevated temperatures I. Hisato; M. Takanashi; T. Nakamura
5:30 PM-8:00 PM
ICACC-S1-P017-2016. Lithium disilicate glass-ceramics fabricated by heat treatment of lithium metasilicate glass-ceramics obtained by hotpressing H. Zhang; J. Yang
5:30 PM-8:00 PM
ICACC-S1-P019-2016. Effect of BaO addition on the properties of glass-ceramic materials from the SiO2-Al2O3-CaO-MgO-Na2O-K2O system J. Partyka; M. Sitarz; K. Pasiut; M. Lesniak; M. Gajek
5:30 PM-8:00 PM
ICACC-S1-P020-2016. Effect of the M-A bonds on the Mechanical Properties in MAX phases W. Son; T. Duong; A. Talapatra; H. Gao; M. Radovic; R. Arroyave
5:30 PM-8:00 PM
ICACC-S1-P022-2016. Microstructure and mechanical properties of mullite–whiskers reinforced lithium disilicate glass-ceramic matrix composites for dental restoration Y. Zhang; J. Yang
5:30 PM-8:00 PM
ICACC-S1-P023-2016. Effect of chemical diffusion between Si3N4 ceramics and Stainless Steel on cutting performances of the ceramics cutting tools Y. Long; J. Zhang; R. Huang; H. Lin
5:30 PM-8:00 PM
ICACC-S1-P024-2016. Fabrication and characterization of joined single-end type RBSC radiant tube H. Shin; B. Yun; Y. Kim
5:30 PM-8:00 PM
ICACC-S1-P025-2016. The Study on Variables of SiC Granule Prepared from Solar Cell Wafer Sludge B. Yun; H. Shin; Y. Kim
5:30 PM-8:00 PM
ICACC-S1-P026-2016. Effects of plasma-treated glass fiber on mechanical properties of glass fiber-reinforced epoxy concrete Y. Kim; W. Seo; M. Kim
5:30 PM-8:00 PM
ICACC-S1-P027-2016. Modeling of Crack Arrest Process of Discontinuous Carbon Fiber/SiC Matrix Composites: For Design of Optimum Microstructure Y. Atsumi; K. Kajihara; K. Yonekura; Y. Kagawa
5:30 PM-8:00 PM
ICACC-S1-P028-2016. Effect of short artificial crack on deformation and fracture behavior of discontinuous carbon fiber-dispersed SiC matrix composite K. Kajihara; Y. Atsumi; K. Yonekura; Y. Kagawa
5:30 PM-8:00 PM
ICACC-S1-P029-2016. International Standards for Properties and Performance of Advanced Ceramics – 30 years of Excellence M.G. Jenkins; J. Salem; G.D. Quinn; J. Helfinstine; S. Gonczy
5:30 PM-8:00 PM
ICACC-S1-P030-2016. Effect of Sintering Additive and Temperature on Densification and Physical Property of Sintered Silicon Carbides S. Kim; Y. Oh; S. Lee; S. Lee; Y. Han; C. Park; Y. Kim
5:30 PM-8:00 PM
ICACC-S1-P031-2016. Super-Low Friction Mechanism of Carbon Nitride Thin Films by Tight-Binding Quantum Chemical Molecular Dynamics Simulations M. Nakamura; S. Sato; J. Chida; H. Murabayashi; T. Tsuruda; Y. Wang; S. Bai; Y. Higuchi; N. Ozawa; K. Adachi; M. Kubo
5:30 PM-8:00 PM
ICACC-S1-P032-2016. Chemical Reaction Process of Si3N4 under Water Lubrication by Tight-Binding Quantum Chemical Molecular Dynamics Method J. Chida; T. Tsuruda; H. Murabayashi; W. Yang; S. Bai; T. Nishimatsu; Y. Higuchi; N. Ozawa; K. Adachi; M. Kubo
5:30 PM-8:00 PM
ICACC-S1-P034-2016. Removal of methomyl insecticide from wastewater using new synthesized anodes M. El Hajji

5:30 PM-8:00 PM
ICACC-S2-P037-2016. Evaluation of invisible changes in BSAS/BSAS/Mullite Si/SiC/SiC) environmental barrier coating system Y. Arai; Y. Aoki; Y. Kagawa
5:30 PM-8:00 PM
ICACC-S2-P038-2016. Measurement of Delamination Toughness in Mullite/Si/(SiC/SiC) Model Environmental Barrier Coating System Y. Aoki; Y. Arai; Y. Kagawa
5:30 PM-8:00 PM
ICACC-S4-P039-2016. Characterization of Boron Carbide Fragments Subjected to Dynamic and Static Loading K.A. Kuwelkar; V. Domnich; J.D. Hogan; D. Mallick; R.A. Haber
5:30 PM-8:00 PM
ICACC-S4-P040-2016. Improved Method for Preparing TEM Specimens of the Deformation Zones Beneath Knoop Indents in Boron Carbide and Silicon Carbide S.D. Walck; J. LaSalvia; K. Behler; S.G. Hirsch
5:30 PM-8:00 PM
ICACC-S4-P041-2016. Low temperature fabrication of reaction bonded composites N. Frage; H. Dilman; E. Oz; E. Ionash; S. Hayun
5:30 PM-8:00 PM
ICACC-S4-P042-2016. SPS sintered silicon carbide-boron carbide composites Z. Ayguzer Yasar; R.A. Haber
5:30 PM-8:00 PM
ICACC-S4-P044-2016. Rate-dependent Hardness and Amorphization Response of Nano-grained Boron Carbide M. DeVries; J. Pittari; P. Jannotti; G. Subhash
5:30 PM-8:00 PM
ICACC-S4-P045-2016. Chemical Interactions in B4C/WC-Co and B6O/WC-Co Powder Mixtures Heated Under Inert and Oxidizing Atmosphere J. LaSalvia; E.R. Shanholtz; S.D. Walck; K.D. Behler; K.A. Kuwelkar
5:30 PM-8:00 PM
ICACC-S4-P065-2016. Synthesis and Crystal Structures of Filled Variants of Boron Carbide AxB13C2 with A = Li, Be, Al, Si H. Hillebrecht
5:30 PM-8:00 PM
ICACC-S4-028-2016. TEM Characterization of the Deformed Region Beneath Knoop Indents in Boron Carbide J. LaSalvia; S.D. Walck; K.D. Behler
5:30 PM-8:00 PM
ICACC-S10-P046-2016. Elastic constants of binary nitride epitaxial thin films MeN (Me= Ti, Zr, V, Nb AND Ta) grown by reactive magnetron sputter deposition G. Abadias; P. Djemia; L. Belliard
5:30 PM-8:00 PM
ICACC-S10-P048-2016. First principle calculation of crystal structure, electronic structure, and optical properties of rare earth element doped Ba(Zr,Mg,Ta)O3 L. Wang; Y. Wu
5:30 PM-8:00 PM
ICACC-S10-P049-2016. Simulations of Anisotropic Texture Evolution on Paramagnetic and Diamagnetic Materials Subject to a Magnetic Field Using Q-State Monte Carlo J. Allen
5:30 PM-8:00 PM
ICACC-S10-P050-2016. Crystal Growth Simulation of MgO Thin Film on SiO2 Substrate by Molecular Dynamics Simulation S. Kawagishi; T. Kuwahara; J. Xu; T. Nishimatsu; Y. Higuchi; N. Ozawa; M. Kubo
5:30 PM-8:00 PM
ICACC-S12-P051-2016. Effect of carbon fiber and boron carbide particle on the distribution and content of residual silicon of reaction bonded silicon carbide composites S. Song; C. Bao; J. Yang
5:30 PM-8:00 PM
ICACC-S12-P052-2016. TEM and XPS Investigations of Ordered MAX Phases: Mo2TiAlC2 and Mo2Ti2AlC3 J. Halim; B. Anasori; M.

Dahlqvist; E. Moon; J. Lu; B. Hosler; E. Caspi; S. May; L. Hultman; P. Eklund; J. Rosen; M. Barsoum
5:30 PM-8:00 PM
ICACC-S13-P053-2016. Plasma Spray Coating on the Graphite between Ceramic and Uranium Alloy Compatibility S. Oh; S. Kuk; H. Jun; K. Kim; C. Lee
5:30 PM-8:00 PM
ICACC-S13-P054-2016. Effect of Yttria-Scandia Addition on Thermal Properties of Particle Based Accident Tolerant Fuel L. Kwang-Young; S. Lee; Y. Na; Y. Kim
5:30 PM-8:00 PM
ICACC-S13-P055-2016. Fabrication and corrosion behavior of graphite foil-bonded commercial graphite C. Ju; T. Fang; H. Lin; K. Lee; J. Chern Lin
5:30 PM-8:00 PM
ICACC-S13-P056-2016. Synthesis of Li5AlO4 powder by using Li2CO3 and Al2O3 and atmosphere controlled calcination method S. Ogawa; K. Shin-mura; Y. Otani; T. Hoshino; K. Sasaki
5:30 PM-8:00 PM
ICACC-S14-P057-2016. Spark-Plasma Sintered Translucent Mullite Ceramics with Anisotropic Grains A. Kocjan; M. Cesnovar; D. Vengust; A. Dakskobler; T. Kosmac
5:30 PM-8:00 PM
ICACC-S14-P058-2016. Electrical and microstructural properties of NiMn2O4 NTC thermistors by doping 0.1 mol B2O3 without calcination G. Hardal; B. Yuksel Price
5:30 PM-8:00 PM
ICACC-S14-P059-2016. Investigation of microstructure properties in Al2O3 and Al2O3-B2O3 doped ZnO ceramics G. Hardal; B. Yuksel Price
5:30 PM-8:00 PM
ICACC-S14-P061-2016. The thermoelectric properties of STO crystals grown by the EFG technique using Mo crucibles T. Tokairin; V. Garcia; K. Shimamura; U. Haruhiko
5:30 PM-8:00 PM
ICACC-S14-P064-2016. Enhanced Dielectric and Ferroelectric Characteristics in Ca-Modified BaTiO3 Ceramics X. Chen; X. Zhu; W. Zhang
5:30 PM-8:00 PM
ICACC-S14-WW-P060-2016. Attempts to improve the optical transmission on spark plasma sintered YAG ceramics R. Moronta Perez; F.J. Cambier; L. Boilet; P. Aubry; V. Lardot; P. Palmero; L. Henrard; O. Deparis
5:30 PM-8:00 PM
ICACC-S14-WW-P066-2016. New Li2O-Al2O3-SiO2 (LAS) glassceramics for dentistry K. Laczka; M. Laczka; K. Cholewa-Kowalska
5:30 PM-8:00 PM
ICACC-S9-WW-P067-2016. Ceramic foam filter for the filtration of aluminum with different surface chemistrie C. Voigt; B. Fankhänel; M. Stelter; C. Aneziris
5:30 PM-8:00 PM
ICACC-S5-WW-P068-2016. 3D high porous non crystallized 45S5 BioGlass bone tissue scaffold assembled with silk: Characterization, In Vitro and In Vivo research D. Don Lopez; A.P. Tomsia; F. Guitian
5:30 PM-8:00 PM
ICACC-S13-WW-P069-2016. In situ HT-ESEM study of MO2 (M=Ce, Th, U) microspheres sintering: From neck elaboration to microstructure design G.I. Nkou Bouala; R. Podor; N. Clavier; J. Léchelle; N. Dacheaux
5:30 PM-8:00 PM
ICACC-EMERG-WW-P070-2016. Soft Ceramics and High Temperature Lubrication P. Gonzalez; J. ten Elshof

Wednesday, January 27, 2016
5:30 PM-8:00 PM
ICACC-S5-WW-P071-2016. Mg containing biphasic calcium phosphate bioceramics: preparation and in vitro evaluation L. Stipniece; K. Salma-Ancane; J. Locs; O.E. Sigurjonsson
5:30 PM-8:00 PM
ICACC-FS5-WW-P072-2016. Graphene reinforced SiC ceramics sintered by Spark Plasma Sintering E. Bodis; Z. Károly; J. Szépvölgyi
5:30 PM-8:00 PM
ICACC-S14-WW-P074-2016. The role of Na2CO3 flux in preparation of SrSi2O2N2 phosphor and their photoluminescent properties. B.J. Adamczyk; T. Jüstel; J. Plewa; M. Sopicka-Lizer
5:30 PM-8:00 PM
ICACC-S11-WW-P073-2016. Hydrothermal Hot Pressing: A powerful tool for the consolidation of inorganic materials. A. Ndayishimiye; G. Goglio; A. Largeteau; T. Hérisson de Beauvoir; U.C. Seu
5:30 PM-8:00 PM
ICACC-S2-WW-P075-2016. A novel blast coating technique using alumina abrasive for automotive applications. J. Flanagan; B. Twomey; K. Stanton
5:30 PM-8:00 PM
ICACC-S5-WW-P076-2016. Hydroxyapatite/poly(vinyl alcohol) nanocomposite coated TiO2 scaffolds for bone tissue engineering I. Narkevica; L. Stipniece; J. Ozolins
5:30 PM-8:00 PM
ICACC-FS1-WW-P077-2016. Direct and indirect 3D printing of components with geopolymers P. Colombo; G. Franchin; H. Elsayed; P. Scanferla; A. De Marzi; A. Conte; A. Italiano
5:30 PM-8:00 PM
ICACC-S4-WW-P078-2016. Sintering of MgAl2O4: Fundamental Study Through Master Sintering Curves Approach R. Macaigne; M. Sylvain; E. Savary
5:30 PM-8:00 PM
ICACC-S1-WW-P079-2016. Plasticity and anisotropic deformation behaviours of WC, β-Si3N4 and ZrB2 micropillars T. Csanadi; A. Kovalčíková; J. Dusza
Time Session or Event Info
8:00 AM-8:20 AM, Coquina Salon E, Developments in Materials Characterization, Properties, and Response II, Oral, S4: Armor Ceramics, Chair: Jerry LaSalvia, jerry.c.lasalvia.civ@mail.mil, Army Research Laboratory
8:20 AM-10:20 AM, Coquina Salon E, Developments in Ballistic Behavior I, Oral, S4: Armor Ceramics, Chair: Tyrone Jones, tyrone.l.jones20.civ@mail.mil, US Army Research Laboratory
Thursday, January 28, 2016
You have nothing scheduled for this day
Friday, January 29, 2016
You have nothing scheduled for this day
8:40-9:00 AM
ICACC-S4-036-2016. Microstructure-Based Design of Advanced Ceramics for Light-Weight Protection Systems J.D. Hogan; L. Farbaniec; D. Mallick; B. Schuster; T. Sano; J.W. McCauley; K. Ramesh
9:00-9:20 AM
ICACC-S4-037-2016. Performance of Nano Zirconia Toughened Alumina Ceramics under Dynamic Impact Conditions Y. Zhu; H. Shuo; H. Wu; J. Binner; B. Vaidhyanathan
9:40-10:00 AM Break
10:20 AM-12:00 PM, Coquina Salon E, Developments in Ballistic Behavior II, Oral, S4: Armor Ceramics, Chair: Sikhanda Satapathy, sikhanda.s.satapathy.civ@mail.mil, Army Research Laboratory
10:20-10:40 AM
ICACC-S4-040-2016. A Comparison of Damage in Glass and Ceramic Targets B. Aydelotte; P. Jannotti; M. Andrews; B. Schuster

10:40-11:00 AM
ICACC-S4-041-2016. Effect of surface layer on elastic waves and cracking in brittle materials J.R. McDonald
11:00-11:20 AM
ICACC-S4-011-2016. Integrated Investigation on the Amorphization Behavior

Number of Presentations: 35.00

Non Peer-Reviewed Conference Proceeding publications (other than abstracts):

Received Paper

TOTAL:

Number of Non Peer-Reviewed Conference Proceeding publications (other than abstracts):

Peer-Reviewed Conference Proceeding publications (other than abstracts):

Received Paper

TOTAL:

Number of Peer-Reviewed Conference Proceeding publications (other than abstracts):

(d) Manuscripts

Received Paper

TOTAL:

Number of Manuscripts:

Books

Received Book

TOTAL:

Received Book Chapter

TOTAL:

Patents Submitted

Patents Awarded

Awards

Graduate Students

NAME	PERCENT_SUPPORTED
FTE Equivalent:	
Total Number:	

Names of Post Doctorates

NAME	PERCENT_SUPPORTED
FTE Equivalent:	
Total Number:	

Names of Faculty Supported

NAME	PERCENT_SUPPORTED

FTE Equivalent:
Total Number:

Names of Under Graduate students supported

NAME	PERCENT_SUPPORTED

FTE Equivalent:
Total Number:

Student Metrics

This section only applies to graduating undergraduates supported by this agreement in this reporting period

The number of undergraduates funded by this agreement who graduated during this period:	0.00
The number of undergraduates funded by this agreement who graduated during this period with a degree in science, mathematics, engineering, or technology fields:.....	0.00
The number of undergraduates funded by your agreement who graduated during this period and will continue to pursue a graduate or Ph.D. degree in science, mathematics, engineering, or technology fields:.....	0.00
Number of graduating undergraduates who achieved a 3.5 GPA to 4.0 (4.0 max scale):.....	0.00
Number of graduating undergraduates funded by a DoD funded Center of Excellence grant for Education, Research and Engineering:.....	0.00
The number of undergraduates funded by your agreement who graduated during this period and intend to work for the Department of Defense	0.00
The number of undergraduates funded by your agreement who graduated during this period and will receive scholarships or fellowships for further studies in science, mathematics, engineering or technology fields:	0.00

Names of Personnel receiving masters degrees

NAME

Total Number:

Names of personnel receiving PHDs

NAME

Total Number:

Names of other research staff

NAME	PERCENT_SUPPORTED

FTE Equivalent:
Total Number:

Sub Contractors (DD882)

Inventions (DD882)

Scientific Progress

HOW THIS SYMPOSIUM RELATES TO THE RESEARCH INTEREST TO THE US ARMY

The Army's primary goal is to provide its soldiers with the equipment to do their job and return home safely. A strategic element of the future success of the US military against a myriad of potential threats is the performance of armor systems for air and ground vehicles as well as the individual soldier. Ceramic materials are currently used in many armor systems and they will be integral components of future systems. This symposium continues the search for novel material concepts and the development of valid armor design and characterization tools to predict performance.

The 2016 symposium included the following proposed sessions:

- Developments in Transparent and Glass Research
- Developments in Synthesis and Processing
- Developments in Materials and Process Modeling
- Developments in Materials Characterization, Properties, and Response
- Developments in Ballistic Behavior

RESULTS

The Armor Ceramics Symposium was held January 24-29, 2016 in Daytona Beach, FL as part of the 40th International Conference & Exposition on Advanced Ceramics and Composites. The 14th edition of this symposium consisted of 45 oral and poster presentations on the symposium topics listed above. The symposium continues to foster discussion and collaboration between academic, government and industry personnel from around the globe. A peer reviewed proceedings was published that included 14 papers from this symposium. The papers were published in The American Ceramic Society's Ceramic Engineering and Science Proceedings (see citation below) and is available via John Wiley & Sons (www.wiley.com/go/ceramics).

Ceramic Engineering and Science Proceedings, Volume 37, Issue 4; Advances in Ceramic Armor, Bioceramics, and Porous Materials; Jerry LaSalvia, Roger Narayan, and Paolo Colombo, Editors, 2016, The American Ceramic Society

Technology Transfer