



Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION XI
New Frontiers in Multifunctional Material Science and Processing

Serbian Ceramic Society
Institute of Technical Sciences of SASA
Institute for Testing of Materials
Institute of Chemistry Technology and Metallurgy
Institute for Technology of Nuclear and Other Raw Mineral Materials

PROGRAM AND THE BOOK OF ABSTRACTS

Serbian Academy of Sciences and Arts, Knez Mihailova 35
Serbia, Belgrade, 18-20. September 2023.

Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION XI
New Frontiers in Multifunctional Material Science and Processing

Serbian Ceramic Society
Institute of Technical Sciences of SASA
Institute for Testing of Materials
Institute of Chemistry Technology and Metallurgy
Institute for Technology of Nuclear and Other Raw Mineral Materials

PROGRAM AND THE BOOK OF ABSTRACTS

Serbian Academy of Sciences and Arts, Knez Mihailova 35
Serbia, Belgrade, 18-20th September 2023.

Book title: Serbian Ceramic Society Conference - ADVANCED CERAMICS AND APPLICATION XI Program and the Book of Abstracts

Publisher:

Serbian Ceramic Society

Editors:

Dr. Nina Obradović

Dr. Lidija Mančić

Technical Editors:

Dr. Adriana Peleš Tadić

Dr. Jelena Živojinović

Printing:

Serbian Ceramic Society, Belgrade, 2023.

Edition:

120 copies

CIP - Каталогизacija у публикацији
Народна библиотека Србије, Београд

666.3/.7(048)

66.017/.018(048)

SRPSKO keramičko društvo. Conference Advanced Ceramics and Application : New Frontiers in Multifunctional Material Science and Processing (11 ; 2023 ; Beograd)

Program ; and the Book of abstracts / Serbian Ceramic Society Conference Advanced Ceramics and Application XI New Frontiers in Multifunctional Material Science and Processing, Serbian Academy of Sciences and Art Serbia, Belgrade, 18-20. September 2023. ; [editors Nina Obradović, Lidija Mančić]. - Belgrade : Serbian Ceramic Society, 2023 (Belgrade : Serbian Ceramic Society). - 90 str. : ilustr. ; 30 cm

Tiraž 120.

ISBN 978-86-905714-0-6

a) Керамика -- Апстракти б) Наука о материјалима -- Апстракти

COBISS.SR-ID 122849545



Dear colleagues and friends,

We have great pleasure to welcome you to the Advanced Ceramic and Application XI Conference organized by the Serbian Ceramic Society in cooperation with the Institute of Technical Sciences of SASA, Institute of Chemistry Technology and Metallurgy, Institute for Technology of Nuclear and Other Raw Mineral Materials and Institute for Testing of Materials.

It is nice to host you here in Belgrade in person. We are very proud that we succeeded in bringing the scientific community together again and fostering the networking and social interactions around an interesting program on emerging advanced ceramic topics. The chosen topics cover contributions from fundamental theoretical research in advanced ceramics, computer-aided design and modeling of new ceramics products, manufacturing of nano-ceramic devices, developing of multifunctional ceramic processing routes, etc.

Traditionally, ACA Conferences gather leading researchers, engineers, specialists, professors and PhD students trying to emphasize the key achievements which will enable the widespread use of the advanced ceramics products in the High-Tech industry, renewable energy utilization, environmental efficiency, security, space technology, cultural heritage, etc.

Serbian Ceramic Society was initiated in 1995/1996 and fully registered in 1997 as Yugoslav Ceramic Society, being strongly supported by American Ceramic Society. Since 2009, it has continued as the Serbian Ceramic Society in accordance with Serbian law procedure. Serbian Ceramic Society is almost the only one Ceramic Society in South-East Europe, with members from more than 20 Institutes and Universities, active in 9 sessions..

Dr. Nina Obradović
President of the Serbian Ceramic Society

Dr. Suzana Filipović
President of the General Assembly of the Serbian Ceramic Society

Conference Topics

- Basic Ceramic Science & Sintering
- Nano-, Opto- & Bio-ceramics
- Modeling & Simulation
- Glass and Electro Ceramics
- Electrochemistry & Catalysis
- Refractory, Cements & Clays
- Renewable Energy & Composites
- Amorphous & Magnetic Ceramics
- Heritage, Art & Design

Conference Programme Chairs:

Dr. Nina Obradović SRB

Dr. Lidija Mančić SRB

Scientific Committee

Academician Antonije Đorđević

Academician Zoran Popović

Academician Velimir Radmilović

Dr. Nina Obradović

Dr. Lidija Mančić

Prof. Dr. Reuben Jin-Ru Hwu

Prof. Dr. Hans Fecht

Prof. Dr. Vladimir Pavlović

Prof. Dr. Bojan Marinković

Dr. Takashi Goto

Dr. Steven Tidrow

Dr. Snežana Pašalić

Dr. Nebojša Romčević

Dr. Zorica Lazarević

Dr. Aleksandra Milutinović–Nikolić

Dr. Predrag Banković

Dr. Zorica Mojović

Dr. Nataša Jović Jovičić

Dr. Smilja Marković

Prof. Dr. Branislav Vlahović

Prof. Dr. Stevo Najman

Dr. Sanja Stojanović

Prof. Dr. Nebojša Mitrović

Dr. Suzana Filipović

Dr. Darko Kosanović

Dr. Milena Rosić

Organizing Committee

Dr. Nina Obradović

Dr. Lidija Mančić

Academician Antonije Đorđević

Dr. Ivana Dinić

Dr. Marina Vuković

Dr. Suzana Filipović

Dr. Anja Terzić

Dr. Milica V. Vasić

Dr. Maja Pagnacco

Dr. Dalibor Marinković

Prof. Dr. Nebojša Mitrović

Prof. Dr. Vesna Paunović

Prof. Dr. Vera Petrović

Dr. Milica Marčeta Kaninski

Dr. Darko Kosanović

Dr. Jelena Vujančević

Dr. Jelena Živojinović

Dr. Adriana Peleš Tadić

Dr. Nebojša Potkonjak

Dr. Marko Perić

Dr. Magdalena Radović

Dr. Miloš Lazarević

Dr. Stanko Aleksić

M. Sci. Isaak Trajković

Sponsors:

Analysis - Lab equipment,

Turistička organizacija Beograda, Inovacioni centar Mašinskog fakulteta,

Institut za ispitivanje materijala,

Institut za tehnologiju nuklearnih i drugih mineralnih sirovina

¹Materials Science and Engineering, Missouri University of Science and Technology, Rolla, Missouri, United States

²Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Belgrade, Serbia

13.05 – 13.20 **ORL Influence of Fe Doping on the Crystal Structure and Optical Properties of Mechanically Activated SrTiO₃ Powders**

J. Živojinović¹, A. Peleš Tadić¹, D. Kosanović^{1,5}, N. Tadić², Z. Vasiljević³, S. M. Lević⁴, N. Obradović¹

¹Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Knez Mihailova 35/IV, 11000 Belgrade, Serbia

²University of Belgrade, Faculty of Physics, Cara Dusana 13, 11000 Belgrade

³University of Belgrade, Institute for Multidisciplinary Research, Kneza Viseslava 1, 11000 Belgrade, Serbia

⁴University of Belgrade, Faculty of Agriculture, Nemanjina 6, 11080 Belgrade, Serbia

⁵Department of Materials Science and Engineering, Missouri University of Science and Technology, Rolla, MO 65409, USA

13.20 – 13.35 **ORL Why delamination cracks occur in ceramics manufactured via DLP, and how to eliminate them**

Wadih Yared

Institute for Manufacturing Technologies of Ceramic Components and Composites, University of Stuttgart, Germany

13.35 – 13.50 **ORL Structural characteristics of MgAl₂O₄ spinel**

A. Peleš Tadić¹, J. Živojinović¹, N. Tadić², S. M. Lević³, S. Marković¹, V. Pavlović³, S. Filipović¹, N. Obradović¹

¹Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, 11000 Belgrade, Serbia

²University of Belgrade, Faculty of Physics, 11000 Belgrade, Serbia

³University of Belgrade, Faculty of Agriculture, 11080 Belgrade, Serbia

13.50 – 14.05 **ORL Diatomic earth: Structure and modification**

Petar Knežević¹, Nikola Vuković², Katarina Mihajlović¹, Marko Vujaković¹, Katarina Pantović-Spajić², Ana Radosavljević-Mihajlović²

¹Faculty of Mining and Geology, University of Belgrade, Đušina 5-7, 11000 Belgrade, Serbia

²Institute for Technology of Nuclear and other mineral raw materials, Franske D Eper 86, Serbia

14.05 - 15.00

Buffet lunch

Club SASA

ORL1

Diatomaceous earth: Structure and modification

Petar Knežević¹, Nikola Vuković², Katarina Mihajlović¹, Marko Vujaković¹,
Katarina Pantović-Spajić², Ana Radosavljević-Mihajlović²

¹Faculty of Mining and Geology, University of Belgrade, Đušina 5-7, 11000 Belgrade, Serbia

²Institute for Technology of Nuclear and other mineral raw materials, Franshe D Eperre 86,
Serbia

One of the most interesting secondary raw materials within the Kolubara Basin is diatomaceous earth or diatomite, with reserves of 308.670 t in fields B and C. Chemical and mineralogical tests were performed on diatomaceous earth samples. The results of these tests are presented in this paper. Diatomite is a soft sedimentary rock formed by the deposition of cell walls (frustulae) of single-celled algae-diatoms at the bottom of sea and lake basins. Diatom frustules consist of two parts that lie on top of each other and represent a highly porous skeleton of amorphous hydrated silica. Diatom frustule size ranges from 1 μm to 1 mm, usually 10-200 μm. The specific area (S_{BET} (m²/g)) is 47.6. The SEM/EDS, BET and FTIR methods were used for characterization. Based on the presented results, diatomaceous earth can be used in the pharmaceutical, ceramic and food industries.

ORL2

β-NaYF₄:Yb,Tm@TiO₂-Acac core-shell structure for efficient photocatalysis

Lidija Mančić¹, Ivana Dinić¹, Lucas A. Almeida², Jessica Gil-Londoño², Marina Vuković³,
Paula Jardim⁴, Bojan A. Marinković²

¹Institute of Technical Science of SASA, Kneza Mihaila 35/4, Belgrade, Serbia

²Department of Chemical and Materials Engineering, Pontifical Catholic University of Rio de Janeiro Rio de Janeiro, RJ, Brazil

³Innovative Centre, Faculty of Chemistry, University of Belgrade, Serbia

⁴Department of Metallurgical and Materials Engineering, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil

Novel hybrid core-shell structure with extensive absorption was synthesized by a two-step wet-chemical route. Up-converting β-NaYF₄:Yb,Tm core was obtained through EDTA-assisted hydrothermal process, while the shell of anatase TiO₂-Acetylacetonate charge transfer complex (TiO₂-Acac) was formed over these *via* sol-gel method. Tetracycline was used to investigate photocatalytic efficiency of obtained structure under irradiation of reduced power Vis and NIR spectra. Owing to the fact that ¹D₂→³F₄ and ¹G₄→³H₆ emission of Tm³⁺ matches well with the absorption edge of TiO₂-Acac, radiation-reabsorption and FRET processes improve the overall generation of reactive oxygen species and degradation of tetracycline. Besides it, formation of tetracycline intermediates immediately after the addition of this novel hybrid core-shell structures, making them a promising material for water purification through the synergy of catalytic and photocatalytic processes.