



Serbian Ceramic Society Conference
ADVANCED CERAMICS AND APPLICATION X
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, 26-27. September 2022.

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

Publisher:

Serbian Ceramic Society

Editors:

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Printing:

Serbian Ceramic Society, Belgrade, 2022.

Edition:

120 copies

CIP - Каталогизacija y publikaciji
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 (10 ; 2022 ; Beograd)

Program ; and the Book of abstracts / Serbian Ceramic Society Conference Advanced Ceramics and Application X New Frontiers in Multifunctional Material Science and Processing, Serbia, Belgrade, 26-27. September 2022. ; [editors Nina Obradović, Lidija Mančić]. - Belgrade : Serbian Ceramic Society, 2022 (Belgrade : Serbian Ceramic Society). - 96 str. : ilustr. ; 30 cm

Tiraž 120.

ISBN 978-86-915627-9-3

а) Керамика -- Апстракти б) Наука о материјалима -- Апстракти в) Наноматеријали -- Апстракти

COBISS.SR-ID 74827529



Dear colleagues and friends,

We have great pleasure to welcome you to the Advanced Ceramic and Application X 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. This Conference is dedicated to Prof. Dr. Vojislav Mitić, president of Serbian ceramic society, who passed away in September 2021.

It is nice to host you here in Belgrade in person. As you probably know, Serbia launched a vaccination campaign at the beginning of last year, so up to date more than 70 percent of the adult population has been vaccinated. Since there is no one statistic to compare the COVID19 outbreaks and fears for loved ones in different countries, we believe that we all suffer similarly during this pandemic. That is why we appreciate even more your positive attitude and readiness to travel in this uncertain time. We deeply hope that the ACA X Conference will be worth remembering, that you will respect all COVID-19 safety measures at SASA building, that you will have a nice time here and that ultimately you will return to your home safely. 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. Part of our members are also members of the Serbian Chapter of ACerS since 2019. Their activities in the organization of this conference is highly recognized. To them and all of you thanks for being with us here at ACA X.

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

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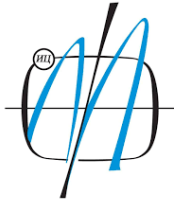
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Sponsors:

Analysis - Lab equipment,
Turistička organizacija Beograda, Inovacioni centar Mašinskog fakulteta,
Institut za ispitivanje materijala, Jeol
Institut za tehnologiju nuklearnih i drugih mineralnih sirovina, Kefo, SCAN



Acknowledgements:

Ministry of Education, Science and Technological Development RS
Serbian Academy of Sciences and Arts
Institute of Technical Sciences of SASA, Institute of Physics BU
American Ceramic Society – Serbian Chapter
Hotel Palace, Shenemil



Book of Abstracts

minimize the function, which often has many local minima. Undoubtedly, the identification of constitutive parameters in brittle materials belongs to this group of issues. The article presents a method of calibrating the problems of non-convex functions of many variables. The method is based on an iterative refinement of the representation of the objective function composed of its expected value and corresponding uncertainty. The new points used to update the approximation are selected so as to explore the parameter space in search of the global minimum and at the same time reduce the standard deviation of the estimation where the greatest mapping inaccuracies occur. The presented algorithm is characterized by high efficiency and speed of calibration of even very complex models.

INV22

Natural brick of Viminacium

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Building activity in Viminacium, an important Roman legionary fortress and a city on the Danube in today's Serbia, was influenced by its natural surroundings. They influenced the position and orientation of the first fortification, built in the 1st century AD, as well as the range of raw materials for the construction of buildings in all of Viminacium's life phases. The first building material along with wood that Romans encountered after coming to the northern edge of the Stig Plain must have been red burnt soil created by coal combustion, whose source is only a few kilometres from the fortress. The first ramparts were constructed using blocks made of this material, called "crvenka" by the local people, which was used for building purposes in the wider area until relatively recently. It is very well known that man-made brick was used as an artificial material with pozzolanic features added to Roman lime mortars. Viminacium was a provincial centre of brick production, using local soil as a raw material. Since crvenka can be recognised as a kind of "natural brick" made of local sediments, an assumption was made that it could also have been used in Viminacium lime mortars as a natural pozzolanic addition. After laboratory research of its mineralogical, mechanical, physical, and chemical characteristics, crushed and ground crvenka was mixed with lime. Mortars with excellent mechanical properties were created, offering us one of the indicators of their possible hydraulicity. With the knowledge of the firing temperatures that could have been developed in Roman brick kilns, this research will be continued. An attempt to determine the temperature that red ceramic fragments, visible in the composition of Viminacium mortars, were fired at, will be made, leading us further towards their possible characterisation as artificial or "natural" brick.

Acknowledgments

This research was supported by the Science Fund of the Republic of Serbia, PROMIS, #6067004, MoDeCo2000.