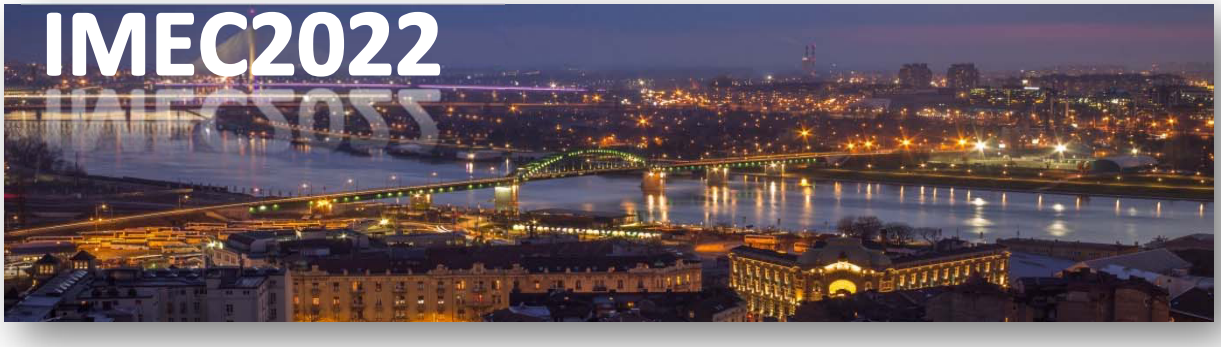
1st International Conference on Innovative Materials in Extreme Conditions



PROGRAM

and

BOOK OF ABSTRACTS

22-23 March 2022

Belgrade, Serbia

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Program and Book of Abstracts of The 1st International Conference on Innovative Materials in Extreme Conditions (IMEC2022) publishes abstracts from the field of material science, physics, chemistry, earth, and computation science on the phenomena arising during the processing and/or exploitation of the innovative materials, which are presented at the international conference on innovative materials in extreme conditions.

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Dr. Rer. Nat. Branko Matović
Dr. Ivana Cvijović-Alagić
Dr. Vesna Maksimović

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Preface

Dear conference participants and readers, we have the pleasure to welcome you all to Belgrade, Serbia as the venue for the 1st International Conference on Innovative Materials in Extreme Conditions (IMEC2022). This event is jointly organized by the Serbian Society for Innovative Materials in Extreme Conditions (SIM-EXTREME), the Center of Excellence "Center for Synthesis, Processing and Characterization of Materials for Application in Extreme Conditions - CEXTREME LAB", University of Belgrade, the Faculty of Science and Mathematics, University of Niš, and the Faculty of Mechanical Engineering, University of Belgrade.

The scope of the IMEC2022 is to become the worldwide forum for discussion of experts and young researchers on the phenomena arising during the processing and/or exploitation of the innovative materials. The IMEC2022 conference is focused on the current research in the field of material science, physics, chemistry, earth, and computation science. Experimental and computational investigations of materials obtained or operated under extreme conditions presented during the conference are highlighting recent progress in the development of the innovative materials at high pressures, under high magnetic and electric fields, over a wide range of temperatures, radiation conditions, corrosive environments, under extreme mechanical loads and non-equilibrium thermodynamic conditions. The interrelation between external effects, microstructural characteristics, and material properties is considered on the experimental and theoretical level to obtain new or enhanced insights into the material behavior and their application.

We want to use this opportunity to thank our sponsors and co-organizers for helping us to successfully organize the IMEC2022 conference. First of all, we want to mention that the Ministry of Education, Science and Technological Development of the Republic of Serbia recognized our conference as an important event and gave their financial endorsement. Also, we want to thank the Vinča Institute of Nuclear Sciences – National Institute of the Republic of Serbia, University of Belgrade, for their strong financial support. In the end, we would like to thank all the members of the Conference Advisory Board, the Conference International Scientific Committee, and the Conference Organizing Committee who participated in the preparations of the IMEC2022 conference.

Editors

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TABLE OF CONTENTS

Synthesis and characterization of a new Dy^{3+} and Sm^{3+} doped $SrGd_2O_4$ down-conversion nanomaterial obtained via glycine-assisted combustion synthesis

Tijana Stamenković, Nadežda Radmilović, Jelena Erčić, Maria Čebela, Vesna Lojpur

Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia, P.O. Box 522, 11001 Belgrade, University of Belgrade, Serbia

In this investigation, down-conversion nanopowders of $SrGd_2O_4$ doped with different concentrations of either Dy^{3+} or Sm^{3+} ions were examined. All samples were prepared via glycine-assisted combustion method, first burned at 500 ºC for 1.5h and additionally calcined at 1000 ºC for 2.5h, at ambient room temperature. The XRD analysis confirmed that all samples crystallize as single phase and the orthorhombic lattice $SrGd_2O_4$. TEM analysis determined high degree of crystallinity of samples with grain size of approximately 200 nm for Dy^{3+} doped and 150 nm for Sm^{3+} doped $SrGd_2O_4$. For both samples SAED showed that diffraction rings correspond to the *hkl* plane indices of $SrGd_2O_4$, while EDS indicated presence of Dy in crystal structure. Results of luminescent characterization demonstrated all appropriate emission peaks related to either Dy^{3+} or Sm^{3+} dopant ions. Investigation of dopant concentration revealed that the lowest values of both dopants have the most prominent emission peaks, while coordinates obtained from the CIE diagram showed emission shifting with the change of concentration.

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