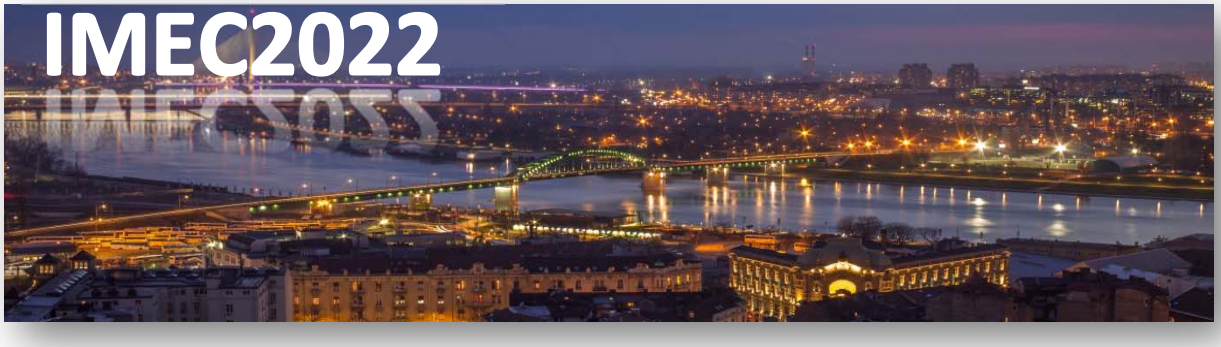
1st International Conference on Innovative Materials in Extreme Conditions



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
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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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Influence of host lattice on luminescence properties of up-conversion Ln_2MoO_6 (Ln=Y, Gd) powders co-doped with Er^{3+}/Yb^{3+} synthesised at high temperatures

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Luminescent materials emit radiation when exposed to various types of excitation (ultraviolet radiation, X-rays, electron beam, etc.) and can be comprised of a host lattice with dopant as an activator. One of the extensively investigated luminescent materials is monoclinic Ln_2MoO_6 due to its high thermal stability. In this study, we investigated Ln_2MoO_6 with different concentrations of Er^{3+}/Yb^{3+} concentrations synthetized at temperatures up to 1200ºC. The obtained powders were examined by X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM) and photoluminescence spectroscopy (PL). The results revealed that all powders are single phase Ln_2MoO_6, with particle size in the nano range at lower treatment temperatures (up to 800ºC) and in the micro range at higher calcination temperatures (up to 1200 ºC). Both Y_2MoO_6 :Yb^{3+}/Er^{3+} and Gd_2MoO_6 : Yb^{3+}/Er^{3+} show double emitting luminescence two green emission bands at 525 and 546 nm ($^2H_{11/2}$, $^4S_{3/2} \rightarrow {}^4I_{15/2}$) as well as a red emission band at 657 nm ($^4F_{9/2} \rightarrow {}^4I_{15/2}$). It can be concluded that increase of Yb^{3+} concentration leads to change of the green to red ratio showing the ability for fine-tuning of the color output.

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