



# MME SEE

CONGRESS 2023

5<sup>th</sup> Metallurgical & Materials Engineering  
Congress of South-East Europe  
Trebinje, Bosnia and Herzegovina  
7-10<sup>th</sup> June 2023

BOOK OF  
ABSTRACTS

**MME SEE**

**C O N G R E S S 2 0 2 3**

**5<sup>th</sup> Metallurgical & Materials Engineering**

**Congress of South-East Europe**

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The Association of Metallurgical Engineers of Serbia

## **Co-organizers**

Institute for Technology of Nuclear and Other Mineral Raw Materials in Belgrade, Serbia;  
The Faculty of Technology and Metallurgy at the University of Belgrade, Serbia;  
The Faculty of Technology at the University of Banja Luka, Bosnia and Herzegovina;  
The Faculty of Metallurgy at the University of Zagreb in Sisak, Croatia;  
The Faculty of Natural Sciences and Engineering at the University of Ljubljana, Slovenia;  
The Faculty of metallurgy and technology at the University of Podgorica, Montenegro.

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## **PREFACE**

On behalf of the Scientific and Organizing Committee, it is a great honor and pleasure to wish all the participants a warm welcome to the Fifth Metallurgical & Materials Engineering Congress of South-East Europe (MME SEE 2023) which is being held in Trebinje, Bosnia and Hercegovina, 07 - 10 June 2023.

The MME SEE 2023 is a biannual meeting of scientists, professionals, and specialists working in the fields of metallurgical and materials engineering. The aim of the Congress is to present current research results related to processing/structure/property relationships, advances in processing, characterization, and applications of modern materials. Congress encompasses a wide range of related topics and presents the current views from both academia and industry: Future of metals/materials industry in South-East European countries; Raw materials; New industrial achievements, developments and trends in metals/materials; Ferrous and nonferrous metals production; Metal forming, casting, refractories and powder metallurgy; New and advanced ceramics, polymers, and composites; Characterization and structure of materials; Recycling and waste minimization; Corrosion, coating, and protection of materials; Process control and modeling; Nanotechnology; Sustainable development; Welding; Environmental protection; Education; Accreditation & certification.

The editors hope that Congress will stimulate new ideas and improve knowledge in the field of metallurgical and materials engineering. The Congress has been organized by the Association of Metallurgical Engineers of Serbia, with the co-organization of the Institute for Technology of Nuclear and Other Mineral Raw Materials, Belgrade, Serbia, Faculty of Technology and Metallurgy, University of Belgrade, Serbia, Faculty of Technology, University of Banja Luka, Bosnia and Herzegovina; the Faculty of Metallurgy, University of Zagreb, Sisak, Croatia; the Faculty of Natural Sciences and Engineering, University of Ljubljana, Slovenia; and the Faculty of Metallurgy and technology, University of Podgorica, Montenegro.

Financial support from the Ministry of Science, Technological Development and Innovation of the Republic of Serbia to researchers from Serbia for attending the congress is gratefully acknowledged. The support of the sponsors and their willingness to cooperate have been of great importance for the success of MME SEE 2023. The Organizing Committee would like to extend their appreciation and gratitude to all sponsors and friends of the conference for their donations and support.

We would like to thank all the authors who have contributed to this book of abstracts and also the members of the scientific and organizing committees, reviewers, speakers, chairpersons, and all the conference participants for their support of MME SEE 2023. Sincere thanks to all the people who have contributed to the successful organization of MME SEE 2023.

On behalf of the 5<sup>th</sup> MME SEE Scientific and Organizing Committee

Miroslav Sokić, PhD

**EVALUATION OF PARAMETERS FOR THE PRODUCTION OF Al-WO<sub>3</sub> COMPOSITES**

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The paper presents the results of the analysis of the influence of the synthesis parameters on obtaining the composite system (WAl<sub>12</sub> + Al<sub>2</sub>O<sub>3</sub>)/Al with improved mechanical properties. The starting powders of Al and WO<sub>3</sub> were homogenized until reaching the required composition with 1%, 2%, 5% and 7% WO<sub>3</sub>. After homogenization, the obtained samples were pressed under a pressure of 10 MPa. The sintering of the obtained samples was performed in an argon atmosphere at temperatures of 550 °C, 585 °C, 615 °C and 650 °C for 20, 40 and 60 minutes. As a result of the test, it was concluded that the sintering temperature, as well as the sintering time, do not have a significant effect on the increase in hardness of these composites. The main parameter that affects the increase in strength of these composites is the WO<sub>3</sub> content. With an increase in the WO<sub>3</sub> content, there is an increase in the hardness of the composite.

**Keywords** temperature, time, powders, content, hardness

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