



MACEDONIAN UNION OF METALLURGISTS



**VIII<sup>th</sup> INTERNATIONAL  
METALLURGICAL CONGRESS**  
METALLURGY, MATERIALS, ENVIROMENTAL (MME)

**BOOK OF ABSTRACTS**

**30.05 - 03.06. 2018**  
**OHRID, MACEDONIA**



**MACEDONIAN UNION OF METALLURGISTS**

VIII<sup>th</sup> International Metallurgical Congress,  
**METALLURGY, MATERIALS  
AND ENVIRONMENT**

**30<sup>th</sup> May – 3<sup>rd</sup> June 2018**

**Ohrid, Republic of Macedonia**

**BOOK OF ABSTRACTS**

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**Perica Paunović, Sveto Cvetkovski & Goran Načevski**

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*organized by*

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## **SCIENTIFIC TOPICS**

- Physical and Mechanical Metallurgy, **PMM**
- Extractive Metallurgy, **EM**
- Plastic Deformation and Metal Processing, **PDMP**
- Welding, **W**
- Casting of Metals, **CM**
- Electrochemistry, **E**
- Process Engineering and Management, **PEM**
- Nanomaterials and Nanotechnologies, **NN**
- New and Advanced Materials, **NAM**
- Environmental Protection, **EP**
- Inorganic and Refractory Materials, **IRM**
- Miscellaneous, **M**

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## ADSORPTION OF CHROMATES, ARSENATES AND SELENATES ON RAW VULCANIC ROCK FOUND ON ETNA

M.D.Bugarčić<sup>1</sup>, M.M.Milivojević<sup>2</sup>, A.D.Marinković<sup>2</sup>, M.D.Sokić<sup>1</sup>, B.R.Marković<sup>1</sup>

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Finding the raw material which can be used as adsorbent of heavy metals from water solution without any modification would be beneficial for solving the capital issue of water pollution. Heavy metal water pollution is a problem of almost every single country, so in the near future huge amounts of adsorbents would be needed to reduce the level of water pollutants. Considering this fact it is necessary to find available, abundant and cheap raw material which can be utilized as adsorbent as is or with minor processing. A plenty of mineral raw material fulfil all requirements of the potential cheap adsorbent. Aim of this paper is to determine potential of volcanic rock found in Etna valley as an adsorbent of heavy metals in anionic form (chromates, arsenates and selenates). Characterization of the volcanic rock was done with chemical methods (AAS, AES, gravimetric analysis, XRF) and physicochemical methods (XRD, FTIR, SEM). Also maximal adsorption capacity was determined. All the results of adsorption capacity were satisfying considering the mineral composition, granulation and porosity.

**Key words:** adsorption, anionic heavy metals, volcanic rock, Etna

**n.b.: Manuscripts submitted for this Congress were not subjected to language or other corrections, except in some extreme cases.**

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