

# YOURS 2019

## ABSTRACT PROCEEDINGS

YOUng ResearcherS Conference 2019

26 - 27 March 2019

Ministry of Education, Science and Technological Development

Editorial Board of Journal of Applied Engineering Science

Belgrade Fair



# **YOURS 2019**

## **YOUnG ResearcherS Conference 2019**

**26 – 27 March 2019 – Belgrade Fair**

This year's conference topics are related to technologies, materials, production processes, organizational aspects, information technologies and engineering software, standards and regulations, tests and measurements, maintenance and reliability, costs and other economic aspects, fuels and lubricants, ecology and energy efficiency, within three fields:

**VEHICLES AND OTHER MEANS OF TRANSPORTATION, LOGISTICS AND  
TRANSPORT, MILITARY INDUSTRY.**

**YOURS 2019** highlights the presentation of new trends, advances and research in all mentioned areas bringing together prosperous researchers with leading professionals, academicians, universities, industry experts from around the region. The International Conference **YOURS 2019** is dedicated towards supporting young researchers and their results in its broadest sense and promotes innovative practices that advance academic achievements.

### **CONFERENCE ORGANIZERS**

Ministry of Education, Science and Technological Development

Editorial Board of Journal of Applied Engineering Science

Belgrade Fair

### **CONFERENCE SPONZORS**

Thermal Science

Lola Institute

PCC Cert Balkan

## PRODUCTION OF TECHNOLOGY METALS FROM WASTE ELECTRONICS

Maja Mandić<sup>1</sup>, Jovana Đokić<sup>2</sup>, Nataša Gajić<sup>3</sup>, Jelena Uljarević<sup>3</sup>, Željko Kamberović<sup>1</sup>

<sup>1</sup>Faculty of Technology and Metallurgy, University of Belgrade

<sup>2</sup>Innovation Center of Faculty of Chemistry in Belgrade, Belgrade, Serbia

<sup>3</sup>Innovation Center of Faculty of Technology and Metallurgy in Belgrade, Serbia

**Summary:** The rising criticality of technologically inevitably metals and the continuous growth of the waste electronics promote a scientific need for development of innovative recycling process, both efficient and selective. Experimental results showed primarily that by pyrometallurgical treatment it is difficult to achieve selectivity, and secondary that the distribution of metals in melting products is too complicated, deviating from the experiential and expected. Therefore, application of an integral pyro - hydrometallurgical treatment is suggested for improved raw materials efficiency. Successful implementation of the developed state-of-art technological process, guarantee more efficient approach to recycling processes, production of new materials which supports the concepts of sustainable development and cleaner production. Proposed technological solution is applicable in industry with relatively low investments compared to expected revenues, allowing companies to become competitive in the regional market and beyond, which is particularly important for small and medium enterprises with lower operating capacities. Techno-economic justification and integral pyro - hydrometallurgical process for waste electronics recycling is presented. This paper explains measures for the further development of the recycling industry as a part of circular economy strategy in Serbia.

**Keywords:** recycling, technology metals, waste electronics, circular economy.



**IMPRESUM**

**Editor: Prof. dr Vladimir Popović**

**Publisher: INSTITUT ZA ISTRAŽIVANJA I PROJEKTOVANJA U PRIVREDI, Beograd**

**For the publisher: Nada Stanojević, dipl.inž.maš.**

**Printed edition processing and design: iipp**

**Conference language: English**

**Volume: 50 copies**

**Publishig year: 2019**

**Printed edition: Sigra Star, Beograd**

**ISBN 978-86-84231-48-4;**