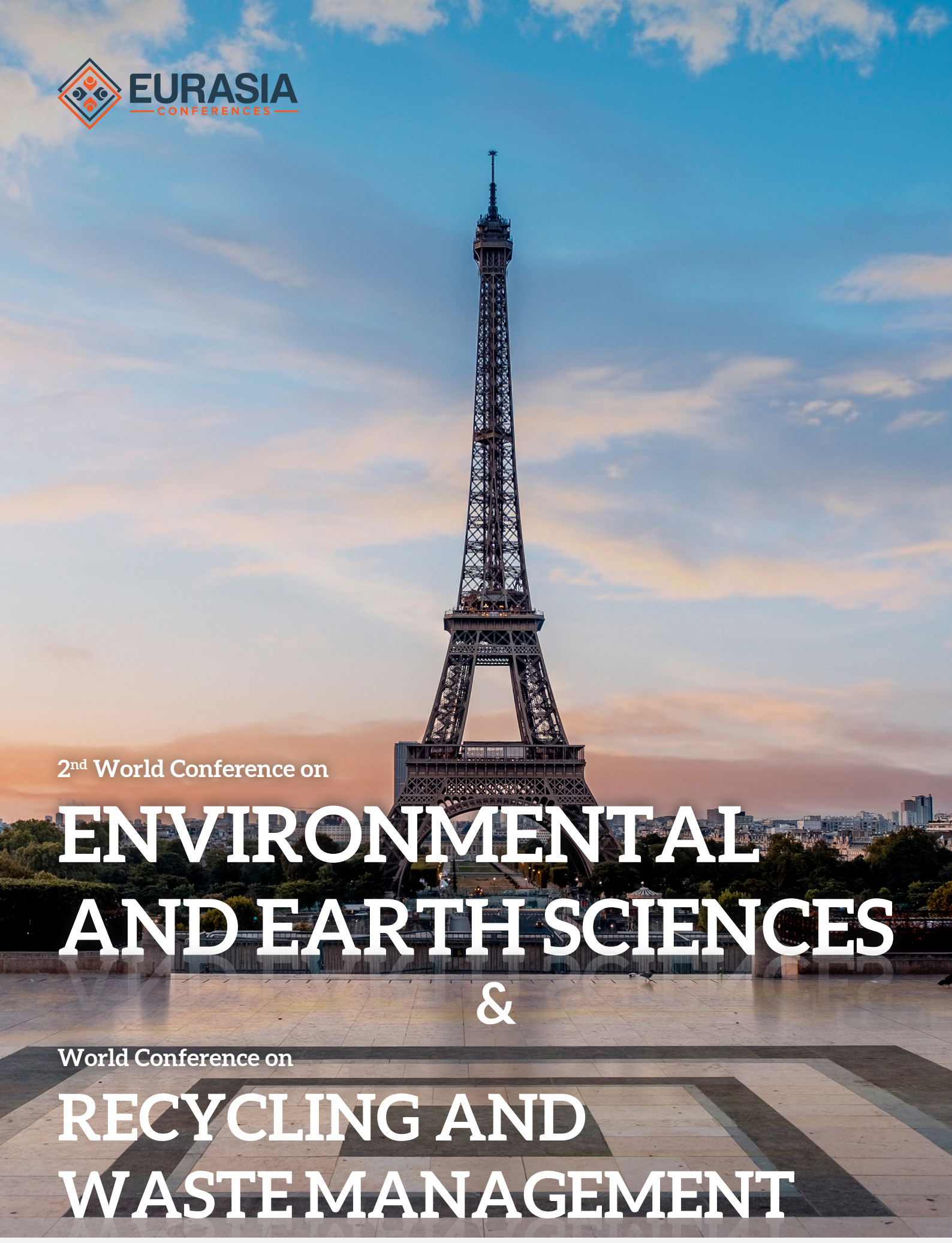

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Hazardous Industrial Waste from Steel Production as Raw Material for Zinc Recovery

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In the steel production process from secondary raw materials, dust from electric arc furnaces (EAF dust), which contains significant amounts of Zn and other heavy metals, is formed as a by-product. EAF dust is characterized worldwide as a hazardous industrial solid waste due to the significant presence of heavy metals, which due to inadequate disposal can lead to a negative impact on the environment and human health. In addition to the effect for environmental protection, the treatment of EAF dust can also have an additional economic effect by valorizing zinc and other useful components. The paper includes a complete physico-chemical and mineralogical characterization of the initial EAF dust sample. In order to zinc recovery as a useful component, the hydrometallurgical treatment of EAF dust was examined, which includes two technological phases: water leaching of EAF dust in order to remove soluble impurities in water, and acid leaching in order to zinc recovery present in the form of ZnO. The optimal parameters in the first phase of water leaching are as follows: ambient temperature, solid:liquid ratio 1:5, reaction time 60 min, pH correction to pH<11, and stirring speed 750 rpm. The optimal parameters in the second phase of acid leaching are as follows: concentration of H2SO4 1.5M with the addition of O2 as oxidant, solid:liquid ratio 1:5, reaction time 10 min, stirring speed 750 rpm at ambient temperature. The above-mentioned combined hydrometallurgical treatment of EAF dust achieved a zinc leaching rate of 82.34%, which confirms the double effect of the treatment.

Biography:

Employed at the Mining and Metallurgy Institute Bor since 2018, at the Center for Development Technologies in Metallurgy, in the title of research associate. She is engaged in hydrometallurgical treatment of raw materials containing precious metals (Au, Ag, Pt, Pd and Rh), development of methods for copper recovery from mining waste using the combined method of leaching - solvent extraction – electrowinning (L-SX-EW), development of technologies for the metals recovery from hazardous wastes and other waste components, as well as the development of research projects. She is the author or co-author of a significant number of national and international papers.