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Flotation Tailings as a Raw Material for Copper Recovery [Hazardous Waste Materials and Its Recycling]

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For the present investigation in this paper, the samples of flotation tailings were taken from the Old Flotation Tailing Dump (OFTD) of the Mining and Smelting Complex Bor (now Serbia Zijin Copper doo) in eastern Serbia. OFTD presents a typical example of source of contamination through the acid mine drainage processes. The average copper content in the OFTD is about 0.2%, and the estimated amount of tailings amounts to 27 million tons, so it represents a significant potential raw material for copper recovery. The paper contains a complete physico-chemical and mineralogical characterization of the composite tailings sample, as well as the Leaching test and TCLP (Toxicity Characteristic Leaching Procedure) test, which indicates that OFTD represents a significant environmental problem because it leads to the generation of acidic mine waters that pollute the surrounding watercourses. Experimental tests aimed to define the influence of the key parameters of the leaching process (temperature, reaction time, pH of leaching solution, solid/liquid ratio and presence of oxidants) on the copper leaching degree. The obtained results indicate that the highest copper leaching degree, without the addition of oxidant, was achieved under the following conditions of the leaching process: reaction time 4 h, temperature 80°C, pH of leaching solution: 1 and solid/liquid ratio of 1: 2.5. Copper leaching degree was about 60%, which is exactly the participation of oxide copper forms regarding the total copper content of the flotation tailings. By adding an oxidant, copper leaching degree increases to 75%.

Biography:

Employed at the Mining and Metallurgy Institute Bor since 1988, at the Center for Development Technologies in Metallurgy, currently in the position Head of Center. She is engaged in research, development and application of new technologies in the field of hydrometallurgical treatment of gold-bearing ores and concentrates; Refining precious metals from primary and secondary raw materials and obtaining precious metals of commercial quality; Development of technologies for copper recovery from mining waste; Participant of national, IPA and international projects in the field of environmental protection. She is the author or co-author of a large number of national and international papers.