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Combination of Processes to Obtain Zn from Jarosite Waste

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The paper presents a procedure for obtaining Zn from jarosite waste raw material by combining low-temperature roasting at 530°C and leaching in water with its simultaneous separation from Fe. By low-temperature roasting, iron was converted from the $\text{Fe}_2(\text{SO}_4)_3$ form into Fe_2O_3 , which is insoluble in water and slightly soluble in acid. As zinc sulfate decomposes at 740°C, the zinc remains in the form of ZnSO_4 , which is easily dissolved in water. In this way, the selectivity of Zn over Fe was achieved. Jarosite is the residue of hot-acid leaching. It is obtained according to the old technology of obtaining zinc. Jarosite with a relatively high content of 4.7% Zn is a technological choice for obtaining products of commercial quality. From the experimental results, by roasting 100g of jarosite for 4 hours at 530°C in electric furnace and leaching the roasted sample in water under the conditions: S:L =1:5, room temperature, time 1h, the leaching degree of 91.97% and 9.60% were obtained for Zn and Fe respectively. By applying the precipitation, using 1MNaOH, on leaching solution, 99.93%Fe is precipitated to the pH=4. Zinc precipitates at a pH > 5.5, so it completely remains in leach solution. Zn in the form of ZnSO_4 can be further treated by the electrolysis process in order to obtain pure electrolytic Zn, or by precipitation with Na_2CO_3 it can be obtained as ZnCO_3 concentrate of commercial quality. The proposed process does not pollute the environment with As and Cd and is better for the environment.

Biography:

Dr Vesna Conić is Metallurgical Engineer and Ph.D. on Technical Science. She has over 20 years of experience in metallurgy sector and hydrometallurgical processes. She has experience in previous HORIZON 2020 "INTMET" project where she working 2016-2019 on developing bioleaching processes for the treatment of polymetallic ore. She was managed a project funded by Ministry of Science Republic of Serbia under the name "Development of environmentally and energy efficiently technologies for the production of non-ferrous and precious metals by bioleaching, solvent extraction and electrolytic refining-TR34004. Other activities where she is involved are solid waste treatment, leaching and solvent extraction processes.