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LEACHING RATE MEASUREMENT OF SLAG FROM TIN MINING INDUSTRY IN BANGKA ISLAND, INDONESIA

Bangka and Belitung Island in Indonesia produce over 90 percent of the country's tin which is the world's biggest exporter of the metal. The most important tin mineral is cassiterite (SnO_2), which is commonly concentrated by gravity separation methods owing to the differences between the density of the materials in the gangue (usually silicates), and flotation techniques. Monazite, xenotime, ilmenite, zircon are obtained as the by-products of the tailings. The smelting process produce concentrated tin which no longer contain radioactivity and slag which classified as a NORM. Base on data from Nuclear Energy Regulatory Agency, the nuclear regulatory body in Indonesia, the amount of slag from tin industry in Bangka Island is 43.851.618 kg. These slags become stockpiles of waste at the site. Up until now, there is no decision related the disposal of these slags. And base on the regulation in Indonesia, NORM waste are not considered as radioactive waste. Nevertheless the high radioactivity of the slags may endanger the workers and people around the mine. This reseach aims to measure the leaching rate of radionuclide from the slags. The accelerated leach test was conducted in distilled water for 7 days with the variation of temperature from 40°C, 70°C, and 90°C. Base on the initial analysis, the slag contains Ra-226, Th-232, Th-228, K-40 with each activity concetration 392.80, 889.73, 945.14, 159.87 Bq/g respectively. The leach rate analysis gave result there were no radionuclide leached in the 40°C leachant, there were Th-232 in the 70°C leachant with leaching rate 2.32 Bq/g/day, and in the 90°C leachant there were Th-232 and Th-228 with leaching rate 34.19 and 18.90 Bq/g/day respectively. This result shows that there were significant amount of radionuclides leaches from the stockpiles of slags. Therefore there is a need to properly manage the NORM waste in Bangka Island.

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