ACID LEACHING OF RARE EARTH ELEMENTS ORE FROM MUSHGAI KHUDAG AREA, MONGOLIA

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ABSTRACT

In this study, acid leaching tests of REE ore from Mushgai Khudag area, Mongolia, were conducted, using sulfuric acid and hydrochloric acid as leaching agents. When sulfuric acid was used as lixiviant, 70-80 % of REE was leached out even at high acid concentration of 13.0 M, due to formation of sulfates. In case of hydrochloric acid, when 2.0 M of hydrochloric acid was used, 90 % of REE was leached out in an hour. As the sample contained a considerable amount of Fe, magnetic separation was conducted to remove iron bearing minerals. Leaching tests with this sample showed that iron concentration in leachate was remarkably reduced from 260 ppm to 60 ppm. Ca content was also very high in this sample. Therefore, two-step leaching tests were conducted to reduce the Ca concentration in the final leachate. In the first step, leaching test was conducted with 1.0 M of hydrochloric acid, and residue was filtered. And then, in the second step, the residue was leached with 2.0 M of hydrochloric acid. As a result, the Ca concentration in the final leachate reduced from 28,000 ppm to 5,000 ppm while still maintaining 90 % leaching of REE components.