

Percolation leaching of oxidized nickel ores

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Abstract

About 70% of the world's reserves of nickel is contained at present in oxidized nickel ores. This type of ore is relatively low compared to the sulfide copper-nickel ores nickel content. Processing method of shaft smelting in Russia is on the verge of profitability. Of the 84 deposits of oxidized nickel ore with the total resources of 6.9 million tonnes of nickel industrial developed only 3: Serovsky, Orsk-Khalilov and Buruktalsky.

Ore containing nickel less than 1 wt.% including certified and high-mg (Mg – 14-20 masses. %) not processed due to a loss-making and technical difficulties. Involvement in the processing of these ores at least two times will increase the resource base of deposits and solve the problem of dump man-made structures.

At the moment, the main methods of processing of oxidized nickel ores are pyrometallurgical and hydrometallurgical methods. Hydrometallurgical method is currently processing 35-40% of the oxidized nickel ore primarily on plants in Cuba, Australia, China.

In our opinion the most promising heap leaching is the oxidized nickel ore with the solutions and their further processing into marketable products suitable for smelting nickel-containing alloys, and for obtaining a commercial nickel. The essence of the process of heap leaching consists in treating the oxidized nickel ore aqueous solutions of H₂SO₄, which allows to extract from a piece of ore valuable components (mainly nickel and cobalt), leaving waste rock in the dump.

In the article, the parameters of heap leaching oxidized nickel ore Serov deposits, including the effects for water concentration, acid concentration and the pause between irrigations. Proposed different optimal modes of leaching stages to 10%, 20-30% and 50% of extraction of nickel.

Held, X-ray and chemical analysis of the raw and leached ore. At relatively low acid consumption obtained solutions without Fe, suitable for further processing of extraction, sorption and hydrolytic methods.

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