Extraction of pure metallic nickel from ores and plants at Ussangoda, Sri Lanka

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Abstract: Samples of serpentine from Ussangoda in the Hambantota District were found to contain 2-3% nickel of minable quality. Laterite from the same location contained 0.4% nickel. Nickel and several other metals in these rocks dissolved almost completely into hot 50% sulphuric acid. Nickel, cobalt, and any zinc that form complexes with ammonia were separated into the aqueous phase by addition of excess ammonia and filtration of precipitated hydroxides of magnesium, iron, manganese, chromium and aluminium. Acidification of the filtrate yielded a solution of nickel sulphate admixed with small amounts of cobalt and zinc. Electrolysis of the filtrate with a conducting tin oxide glass cathode after removal of cobalt yielded pure nickel. The process can also produce nickel ammonium sulphate. Extraction of metallic nickel from a nickel hyperaccumulating plant growing in Ussangoda is also demonstrated. The possibility of nickel mining in Sri Lanka and the importance of petrological, geochemical and ecological studies of the serpentine area at Ussangoda and other localities are discussed.

Keywords: Nickel hyperaccumulators, nickel mining, nickel ores, serpentine, ultramafics.