

Adsorption behavior of cesium ions using sericite impregnated into nickel hexacyanoferrate

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To increase adsorption capacity and selectivity for cesium ions from waste solution, sericite was chemically modified by means of nickel hexacyanoferrate (NiHCF) with a high selectivity trap agent for cesium. The Scanning electron microscopy (SEM) and Energy dispersive X-ray (EDX) spectroscopy were used for the characteristic analysis of surface onto the NiHCF-sericite. The adsorption capacity of cesium ions for the NiHCF-sericite increased about 2.5 times, as compared with natural sericite at initial pH 5.0 of waste solution. Adsorption equilibrium was investigated by Langmuir and Freundlich isotherm model, respectively. Maximum adsorption capacity was estimated as 16.583mg.g and the Langmuir isotherm fits the adsorption data better than Freundlich model. The adsorption process was determined as an exothermic reaction and all adsorption was completed in 30 min. In addition, the adsorption capacity of cesium ions was not greatly affected by ionic strength (~0.1M NaCl concentration) and other metals in mixed waste solution.