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Synergistic Extraction Study of Nickel (II) from Sulfate Medium by Mixtures of Capric Acid and Tri-N-Octylphosphine Oxide in Chloroform

Authors : F. Adjel, S. Almi, D. Barkat

Abstract : The synergistic solvent extraction of nickel ion from 0.33 mol dm^-3 Na2SO4 aqueous solutions with capric acid (HL) in the absence and presence of Tri-n-octylphosphine oxide (TOPO) in chloroform at 25°C, has been studied. The extracted species when the capric acid compound was used alone, is NiL2 and NiL2(HL). In the presence of TOPO, a remarkable enhancement on the extraction of nickel (II) with 0.02 mol dm^-3 capric acid was observed upon the addition of 0.00125 and 0.0025 mol dm^-3 TOPO in chloroform. From a synergistic extraction- equilibrium study, the synergistic enhancement was ascribed to the adduct formation NiL2(TOPO) and NiL2(HL)(TOPO). The TOPO-HL interaction strongly influences the synergistic extraction efficiency. The synergistic extraction stoichiometry of nickel (II) with capric acid and TOPO is studied with the methods of slope analysis. The equilibrium constants were determined.

Keywords : solvent extraction, nickel(II), capric acid, TOPO, synergism