Thermodynamic Studies on Cobalt Extraction by 2-Heptyl-2-methylnonanoic Acid in Benzene from Chloride Solutions[1]

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Abstract—Solvent extraction of Co(II) from aqueous chloride solutions of constant ionic strength (I = 1 M) with a long-chain fatty acid, 2-heptyl-2-methylnonanoic acid (HA), in benzene was studied at four temperatures: 278, 288, 298, and 313 ± 1 K. The influence of various parameters on the extraction equilibrium was studied. The effect of mixing HA with TBP in benzene on the extraction process was examined, and a synergistic effect was revealed. The stoichiometry of the extraction equilibria was determined, and the thermodynamic studies were made for both extraction systems. The thermodynamic functions ΔG^0, ΔH^0, and ΔS^0 were calculated, and the related data were discussed.

Key words: extraction, cobalt, carboxylic acids, thermodynamics, chloride, synergism

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