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Studies of Heterogeneous Hydrothermal Stripping from Iron-loaded Naphthenic Acid–Alcohol–Kerosen

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摘要 The technique of hydrothermal stripping from mixed aqueous-organic systems is a promising method for synthesizing oxide ceramic powders for high-performance applications. Some factors influencing heterogeneous hydrothermal stripping with water from iron-loaded organic phase of naphthenic acid–isooctyl alcohol–kerosene, such as initial concentrations of iron and naphthenic acid, concentration of Fe2O3 “seed”, temperature and time, were investigated. Based on the experimental results, the rate equation was established. Nano-ferric oxide powders were obtained by the technique of hydrothermal stripping from the iron-loaded organic phase. The results suggest that the heterogeneous hydrothermal stripping proceeds in 3 steps: adsorption of naphthenic acid dimers and naphthenic complex of iron onto the surface of “seed”, hydrolysis of adsorbed complex of iron, and condensation of hydrolyzed complex. The process activation energy is 115 kJ/mol and the heterogeneous hydrothermal stripping is controlled by a chemical reaction (the hydrolysis of naphthenic complex of iron).

关键词 iron-loaded organic phase heterogeneous hydrothermal stripping rate equation nano-ferric oxide

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