

Rare-earth Solvent Extraction Process Simulation and Design

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In this research, algorithms and program codes are developed to simulate the solvent extraction process to purify rare earths solution with PC88A and saponified PC88A. Because the thermodynamic equilibrium equations for the rare earth solution have a huge number of variables, it is extremely hard to solve the nonlinear equations in a numerically stable manner due to the initial value problem and divergence problem of the equation solver. A new model reduction method is developed to overcome the numerical problems by reducing the number of the equations. Also, a new parameter estimation method is used to obtain the thermodynamic parameters from experiment data. Finally, a process simulator for the solvent extraction process composed of the extraction, scrubbing and stripping part to purify the rare earth solution is developed.