

Binding Enthalpy of Ligands Capture for Rare Earth Bastnaesite (REFCO₃)

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For froth flotation, a surfactant or collector is needed to selectively render the desired mineral hydrophobic. The interaction energies on the surface of mineral with ligands can directly tell the binding strength and its relation with other factors that affect the surface chemistry, such as temperature, pH, and concentration. We have applied titration calorimetry to quantify the enthalpy generating from rare earth bastnasites interacting with hydroxamic acid and a series of phosphinic acids. The data has been compared with that of calcite, which is the main gangue. This approach can provide a quantitative guide to determine the best collector for the mineral processing/beneficiation.