

# Surface Chemistry Characteristics Associated with Bastnaesite Flotation by Lauryl Phosphate

Bastnaesite is a major mineral resource of importance in the production of rare earth materials. Present flotation practice uses a reagent schedule which typically includes fatty acid or hydroxamic acid as a collector. In this research, it was found that better bastnaesite flotation is achieved at a low level of lauryl phosphate addition when compared to the use of octyl hydroxamate as a collector. Lauryl phosphate adsorption characteristics were examined and explained the outstanding flotation performance of lauryl phosphate as low concentration. Superior selectivity for bastnaesite was achieved using lauryl phosphate when compared with the selectivity using octyl hydroxamate as a collector. Recent initial evaluation indicates that the branched chain 2-ethylhexyl phosphate has even better selectivity compared with lauryl phosphate. It is expected that the results of this research will enable us to understand the bastnaesite/calcite/quartz flotation chemistry using alkyl phosphate collectors with consideration of chemical structure, which includes the hydrophobic surface state, the adsorption mechanism, the phosphate collector design, etc.

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Weiping Liu is a Ph.D. candidate in the Department of Metallurgical Engineering, College of Mines and Earth Sciences, at the University of Utah under the supervision of Professor Jan D. Miller. His recent research focuses mainly on the investigation of the surface chemistry of gold and rare earth flotation. He has contributed to 10 papers, 1 patent and 5 presentations in SME and IPMI conferences. He received graduate student award at 67th MPD Conference and Colonial Metals George Benvegno Memorial Award at IPMI 42nd Conference. He is going to work at Freeport Mineral Corporation, Phoenix as a gold and copper metallurgist.

**4:10 p.m.**

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