

Emerging Industrial Processes for Low Grade Rare Earth Mineral Concentrates

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Historically rare earth recovery has mainly been derived from the processing of monazite, bastnasite and xenotime containing ores amenable to beneficiation, yielding high grade mineral concentrates. A notable exception is the recovery of heavy rare earths from ionic clays in Southern China. Recently, projects are being proposed to treat a range of mineral concentrates which tend to be lower grade with wide ranging modal mineralogy for rare earths and associated gangue minerals. This has a significant impact on processing routes.

This paper discusses processes proposed for emerging rare earth producers and how different projects have responded to particular challenges including:

- control of phosphorous due to the presence of xenotime or monazite type minerals;
- control of phosphorous due to the presence of rare earth containing apatite;
- control of silica due to the presence of eudialyte;
- control fluoride due to the presence of bastnasite;
- rare earth recovery from polymetallic ores;
- approaches to minimisation of acid consumption from gangue minerals; and
- control of radionuclides in rare earth processing.

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