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### Solubilization of phosphate minerals using organic acids and implications on rare earth processing

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Currently, hydrometallurgical processes are the only available method to extract rare earth elements (REEs) from monazite. Conventional hydrometallurgical methods employ extreme conditions including high temperatures, corrosive reagents and concentrated lixiviants. There is thus an impetus to identify more environmentally friendly, less expensive and safer processes to extract REEs. In the present study, the potential for using organic acids to enhance the solubilization of phosphate minerals was reviewed, with a view to relating behavior to monazite. Organic acids have shown applicability in processing phosphate minerals such as dissolving phosphorus from phosphate rocks. With respect to rare earths, it has been demonstrated that these acids have the ability to increase REE mobility and release additional anionic components from REE-bearing and similar minerals, further indicating their impact in dissolution. More specifically, low-molecular-weight organic acids (LMWOAs) such as citric, oxalic and phthalic acids intensify the mineral dissolution in apatite and monazite in natural environments. Therefore, the potential to use organic acids to extract rare earth elements (REEs) from monazite has been established. Experimental results demonstrated that the LMWOAs, especially oxalic acid, achieved a significant amount of monazite dissolution.

#### Biography

Daniel E Lazo has completed his Bachelor's degree from the University of Lima, Peru, and his Master's degree from Purdue University, West Lafayette, USA. He is currently pursuing his PhD degree in Extractive Metallurgy at the Western Australia School of Mines, Curtin University, Australia. He has work experiences in Peru, USA and Australia.

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