LITHIUM ISOTOPES

A Tracer of Past and Present Silicate Weathering

Philip A. E. Pogge von Strandmann
Johannes Gutenberg University and University College London
Mathieu Dellinger
Durham University
A. Joshua West
University of Southern California
Abstract: Lithium isotopes are a relatively novel tracer of present and past silicate weathering processes. Given that silicate weathering is the primary long-term method by which CO$_2$ is removed from the atmosphere, Li isotope research is going through an exciting phase. We show the weathering processes that fractionate dissolved and sedimentary Li isotope ratios, focusing on weathering intensity and clay formation. We then discuss the carbonate and silicate archive potential of past seawater $\delta^7$Li. These archives have been used to examine Li isotope changes across both short and long timescales. The former can demonstrate the rates at which the climate is stabilized from perturbations via weathering, a fundamental piece of the puzzle of the long-term carbon cycle.

Keywords: weathering, erosion, carbon, climate, oceans
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