

Lithium isotope index as powerful research tool for earth resource

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Lithium (Li) is one of important natural resources, because Li is used for secondary battery of electric and/or hybrid vehicles. The lightest alkali element, Li, is one of fluid-mobile elements. The leaching of Li from sediments into fluids is dramatically elevated together with increasing temperature, and the fact that subsequent re-uptake of the leached Li from the fluid by sediments (which occurs as the fluid cools) takes a considerable time. Li is relatively unaffected by surface water contamination because the Li contents of deep-rooted fluid samples are much greater than the surface water content. The two stable isotopes of Li are ⁶Li and ⁷Li, and their relative abundances are about 7.5% and 92.5%, respectively. Furthermore, the difference in the ⁷Li/⁶Li ratio between fluid and solid phases varies with the reaction temperature. As a result, the Li isotope ratio is a potentially useful geothermometer because the Li cation is monovalent and hence not redox sensitive, and it is not a nutrient, so it does not participate in biologically mediated reactions.

In this presentation, I'll talk about fundamental feature of Li isotope tool at first, and after then I show the potential of Li isotope tool for earth resource science.

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