Preliminary Li isotopic study on the Gangdese batholith, southern Tibet

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The lithium (Li) stable isotopes fractionate in near-surface fluid-rock interactions and thus are proposed as a geochemical tracer of terrestrial materials in crust-mantle cycle. Here we report our recent systematic Li isotopic data of the Jurassic-Eocene Gangdese batholith that occurred as an arc associated with tectonic evolution of Neo-Tethyan subduction and collision between India and Eurasia, to provide new constraints on its petrogenesis. Whole rock Li isotopic compositions of our all Gangdese samples (-0.6 to +3.0) are slightly lighter than the global MORB value (+1.6 to +5.6, Tomascak et al., 2008), except one Jurassic granite sample display extreme high δ^7Li (+10.9 ‰) but with the lowest [Li] (8 ppm) that implies an unique source with extremely high Li isotopic values. Regarding those samples of mantle affinity (zircon $\varepsilon_{Hf}(t) \geq +9$) only, their δ^7Li values do not systematic vary with the whole-rock silicate contents (51~77 %), Nd isotopes as well as the $\varepsilon_{Hf}(t)$ and δ^{18}O of magmatic zircons. but generally decrease with the rising Li/Y ratios (0.3 to 13.4) of Gangdese rocks, that is proposed to substabtially represent the input of fluids in magma sources. This is consistent with the observation in the abundance of trace elements (e.g. La/Sm vs Ba/Th) that fluid influence with different degrees can be recognized in the Jurassic, Cretaceous and Paleogene Gangdese samples.