

## Testing the proposed K isotopic composition of the bulk silicate Earth

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Potassium as a volatile element, shows isotopic fractionation between the bulk silicate Moon (BSM) and bulk silicate Earth (BSE) that is important for understanding Moon forming processes [1]. However, limited terrestrial and lunar samples were measured at this point. So far, the estimate of the BSE K isotopic composition is based on mantle-derived basalts [2]. An alternative method is to use the average continental crust, since K is a highly incompatible element during the processes that form the continental crust. Thus, even if there is some isotope fractionation during crust formation, the bulk continental crust is likely to be close to the true BSE value. The difficulty with this approach is that the upper and lower crusts consist of a great variety of compositionally different rock types which need to be analysed. In spite of these difficulties, we have initiated a project to measure K isotopes of both upper and lower crustal rocks. Samples were dissolved in a mixture of concentrated HF, HNO<sub>3</sub>, and HCl using a CEM Mars6 microwave system. Then the solution was dried, re-dissolved in 0.5N HNO<sub>3</sub> and processed twice through the Bio-Rad AG50W-X8 cation exchange resin chromatography columns for K purification. The K isotope composition was measured with a Nu Sapphire MC-ICPMS. So far, all samples are in the range 0 to 0.15 per mil higher than the current BSE estimate, with the exception of one lower crustal sample (~ +0.3 per mil). We are processing more samples from the lower crust to test (1) if there is a difference between the upper and lower continental crust, (2) how this may affect current estimate of the true BSE value, and (3) how it compares to the Moon.

[1] Wang & Jacobsen (2016) *Nature* **538**, 487-490. [2] Wang & Jacobsen (2016) *GCA* **178**, 223-232.