Boron isotope systematics of collisional volcanism in Western Anatolia

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Boron is enriched in volcanic rocks in collisional tectonic zones. This is exemplified in Western Anatolia where hydrothermal leaching of these rocks has also led to formation of large borate deposits. We report $\delta^{11}B$ data from ~50 samples that span the range of ages (Eocene to Quaternary) and types (calc-alkaline to ultrapotassic) of rocks erupted during collisional to post-collisional volcanism in this region. The $\delta^{11}B$ values range in value from -20 ‰ to +5 ‰. The relationship between the $\delta^{11}B$ data and other geochemical indices (radiogenic isotopes, major and trace elements) suggest that this range in $\delta^{11}B$ values can be described by mixing between three endmembers. (1) The enriched mantle source (-1 to -3 ‰) is represented by the OIB-like Na alkaline volcanics. (2) There is an inverse relationship between $\delta^{11}B$ values and K_2O concentrations that is interpreted to represent recycling of a K-rich (phlogopite/phengite) restite with a light $\delta^{11}B$ value (-20 ‰) that formed during extraction of ^{11}B-rich fluids during deep subduction of crustal material during continental collision. This signature is most clearly seen in the ultrapotassic rocks of the Selendi Basin. (3) All the volcanics also show the effects of varying degrees of assimilation of upper crustal material (-5 to +5 ‰), represented by Menderes Massif core complex. Overall, the data are compatible with a geodynamic model [1] in which "normal" arc-type volcanic rocks were erupted in the early stages of continental collision during the Eocene. Thick piles of deeply subducted crust then detached from the subducting slab and became incorporated into the magma generation zone to yield the light $\delta^{11}B$ values observed in the Miocene ultrapotassic rocks. Finally, slab tearing allowed upwelling of asthenospheric mantle generating the Na alkaline volcanics.

[1] Ersoy & Palmer (2013) *Lithos*, **180**, 5-24.