Hf–Os isotopes in Cenozoic alkaline basalts from the Bohemian Massif, Czech Republic

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The suture between the two major units of the Bohemian Massif (Saxothuringian to the north and Bohemian to the south) is paralleled by the Eger/Ohře Rift with occurrences of alkaline mafic lavas that penetrated the surface during the Cenozoic (65–4 Ma). Coupled Hf–Os isotope compositions were determined in a suite of chemically primitive basanitic and olivine nephelinitic lavas (10–16 wt.% MgO; ~300–750 ppm Cr, ~100–300 ppm Ni) sampled perpendicular to the major Eger/Ohře Rift axis in order to trace possible lateral and/or longitudinal source mantle variations. Preliminary results show highly variable Re (47–682 ppt) and Os (18–396 ppt) contents associated with initial $^{187}Os/^{188}Os$ from 0.127 to 0.160 for most samples. This suggests derivation of magma from enriched mantle sources with only limited amount of crustal contamination. In contrast, highly radiogenic $^{187}Os/^{188}Os$ of 0.427 paralleled by very low [Os] (31 ppt) in one sample may hint to moderate degree of crustal assimilation although these inferences must be combined with mantle-like Sr–Li–O isotope signature. Alternatively, mafic lower crustal rocks may be considered an important end member. This would largely be consistent with other Cenozoic occurrences in central Europe [1]. Hafnium and Lu contents (6–9 ppm and ~0.3 ppm, respectively) are comparable to, or slightly higher than, those found for other Cenozoic alkaline volcanic centres in central Europe [1], paralelled by a restricted range in εHf (6.1–8.2). The most depleted Hf isotope compositions are found for primitive basaltic rocks from the eastern part of the Bohemian Massif (SW Poland; εHf=11.9), also carrying particularly depleted Sr–Nd signature. These results imply progressive eastward-trending mantle depletion of Cenozoic alkaline volcanism across Europe, consistent with other isotope data (Sr, Nd) [2]. Additional Pb–Hf–Os isotope analyses are pending.

[1] Jung *et al* (2011) *GCA* **75**, 2664-2683 [2] Blusztajn & Hart (1989) *GCA* **53**, 2689-2696