ICP-MS data of the Southern Ikensky Mg-rich basalts (Siberian Platform)

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According to the Naldrett model [1], the lavas of lower and middle the Nadezhdinsky suites, depleted with ore components were metal sources for Norilsk deposits. Geochemical research of the basalts is important for the understanding of ore-forming processes. We studied the completed flood basalts section for the Southern Iken River at the Norilsk region (Siberian Platform); this section includes a layered cover of Mg-rich basalts (MgO up to 18 wt.%) at the boundary of the Nadezhdinsky (T_1nd) and Tuklonsky (T_1tk) suits. This layered cover (thickness up to 40 m) is the alteration of olivine and picrite varieties of basalts with horizons (thickness from1 to 28 cm) containing dendrite clinopyroxene crystals. The results we obtained correspond well to the published geochemical data of the Norilsk basalts (Fig. 1).

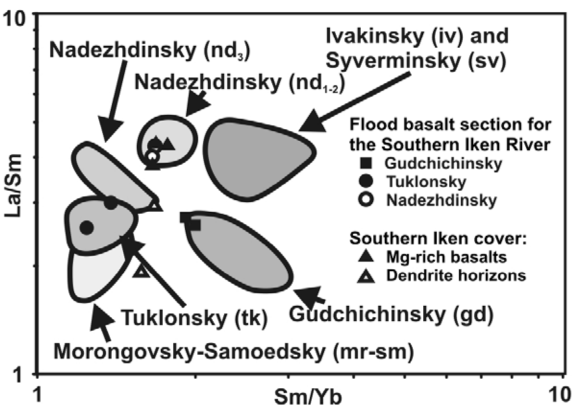

Figure 1: Plot of La/Sm vs. Sm/Yb for basalts of the Norilsk region (after [2])

The data on the Southern Iken cover cannot be distinguished within the only suite, namely Mg-rich basalts are in the field of the Nadezhdinky basalts while the dendrite horizons have low La/Sm contents. Further geochemical studies require the use of isotope methods.

[1] Naldrett *et al*. (1992) *Econ. Geol*. **87**, 975–1004. [2] Lightfoot *et al*. (1990) *Contrib. Mineral. Petrol*. **104**(6), 631–644.

Melt/mantle mixing processes form podiform chromite deposits: Implications from Re-Os systematics of the Dongqiao Neo-Tethyan ophiolite, northern Tibet

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The Re-Os analysis of the Dongqiao ophiolite show that the $^{187}Os/^{188}Os$ ratios of the chromite separates lie in a narrow range (0.12318-0.12354), are less variable than those of the associated peridotites: ultra-depleted dunites have los $^{187}Os/^{188}Os$ (0.11754, 0.11815), harzburgites show a wider range (0.12107 to 0.12612). The average isotopic composition of the chromites (0.12337) is lower than the average for podiform chromitites worldwide (0.12809). In contrast, the basalts have higher $^{187}Os/^{188}Os$ (0.20414 ~0.38067), while the Ol-bearing pyroxenite and gabbros show intermediate values (0.12979~0.14206). Radiogenic melts/fluids derived from the subducting slab may have triggered partial melting in the overlying mantle wedge and added significant amounts of radiogenic Os to the peridotites. Mass balance calculations suggest that a melt/mantle ratio≈15:1 (melt: $^{187}Re/^{188}Os$: 45.3545, $^{187}Os/^{188}Os$: 0.34484; dunite: $^{187}Re/^{188}Os$: 0.007, $^{187}Os/^{188}Os$: 0.11745) is necessary to increase the Os isotopic composition of the chromitite deposits to its observed average value. This implies a surprisingly low average melt/mantle ratio during the formation of the chromite deposits. The percolating melts probably had variable isotopic compositions. However, in the chromitite pods the Os from many melts is pooled and homogenized, which is why the chromitite deposits show limited variation in Os-isotope composition. The results of this study suggest that the $^{187}Os/^{188}Os$ ratio of chromitites is not representative of the DMM, and the Os-isotope data strongly suggest that the chromite deposits can be formed by a melt/mantle mixing process.

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