Pyroxenite veins from SSZ peridotites of Egiingol massif (Northern Mongolia).

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Microstructures, major and trace element composition of rocks and minerals from pyroxenites and harzburgites of Egiingol massif (Dzhida terrain, Central Asian Orogenic Belt) were investigated. Pyroxenites occur as veins (up to 1-2 meters wide) in harzburgites. Harzburgites have geochemical characteristics of supra-subduction peridotites. Orthopyroxenites contain relics of olivine in orthopyroxenes (Opx); websterites contain relicts of orthopyroxenes in clinopyroxenes (Cpx). Spinels of pyroxenites are inherited from harzburgites. Composition of the spinel may have been changed due to metamorphic transformations (over 600 °C) and interaction with a melt. Olivines of pyroxenites have Mg# resemble those of harzburgites but show higher NiO concentrations. Orthopyroxenes of thin veins show similar compositions for orthopyroxenites and contact harzburgites. Mg# of Opx and Cpx are correlate with each other, and decrease from orthopyroxenites to websterites. Compared to orthopyroxenites, wesbterites show larger variation of the pyroxene composition (Al_2O_3, Cr_2O_3, Mg#). Also, composition of websterite pyroxenes is more close to pyroxenes from high-Ca boninites. Apparently, orthopyroxenes were more equilibrated with boninitic melt than clinopyroxenes. Clinopyroxenes are characterized by low HREE, decrease to MREE, and depleted to enriched LREE. Level of M-HREE concentrations of clinopyroxene from orthopyroxenites and websterites is the same. The composition of calculated equilibrium melt for clinopyroxene of websterites is similar to primary composition of high-Ca boninites of Troodos ophiolite [1]. Orthopyroxenites from thin veins have PGE and Re distribution similar to enclosing harzburgites, with lower Os and Ir concentrations in orthopyroxenites. PGE distribution of orthopyroxenite and websterite from thick veins is similar to pattern for boninites. All clinopyroxenes and most orthopyroxenes are enriched in ^{18}O compared with pyroxenes from mantle peridotites. The $\delta^{18}O$ values increase from harzburgite to orthopyroxenite than websterite, from +5.5 to 6.6 ‰. Thus, the model of pyroxenite formation by the interaction of peridotite with high-Ca boninitic melt and replacement sequence: Ol(peridotite)→Opx→Cpx is more consistent.

[1] Sobolev et al. (1996) Petrology **4**, 307–317.