

BASALTIC AND MICA KIMBERLITES OF THE SIBERIAN PLATFORM AND THEIR TIME-SPACE AND GENETIC RELATIONSHIPS.

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Four age groups of kimberlites are distinguished in East-Siberia, namely: Riphean (1260 m.y.), Middle Paleozoic (344-409 m.y.), Lower Mesozoic (217 m.y.) and Upper Mesozoic (149-159 m.y.). Most of contemporaneous bodies form isolated fields and zones. A number of fields comprising bodies of similar ages, are classified as complexes.

In all Phanerozoic complexes both basaltic and mica kimberlite types are present. Their spatial relationships are very diverse. Usually basaltic and mica kimberlites form their own bodies and rarely they coexist in twinned and multiphase pipes and also in veined bodies of different phases. Pockety segregations, autoliths and xenoliths of mica kimberlite are found in many pipes composed of basaltic kimberlites. Abundance ratios of bodies consisted of basaltic and mica kimberlites from different complexes are not similar. All Pre-Cambrian and most of Upper Mesozoic bodies are mica kimberlites. In the Lower Mesozoic complex both rock types occur in equal number of bodies and in the Middle Paleozoic basaltic kimberlites predominate.

Based on detailed study of some Paleozoic bodies stripped in the Udachny mine time-space relationships and isotopic-geochemical features of different kimberlite types, are given. Here at the south-western and eastern edges of quarry two parallel veins (~~NNE~~ 2,4) of mica kimberlites intruded by the Udachnaya-Zapadnaya and Udachnaya-Vostochnaya multiphase pipes, are

exposed. The Udachnaya-Zapadnaya and Udachnaya-Vostochnaya pipes are composed of mica and basaltic kimberlites, respectively. Two "blind" isometric bodies consisted of basaltic kimberlites are stripped along the strike of the vein № 2. Four veins of basaltic kimberlites, which have no contacts with the pipe are exposed at north-western and western edges of the quarry.

Three varieties of mica kimberlite are distinguished at the Udachny mine: 1) massive clinopyroxene-phlogopites, 2) phlogopite breccia and 3) fluidal phlogopites. The first variety composes veined bodies of early phases of emplacement (veins №№ 2,3,4). Phlogopite and clinopyroxene (30-35 and 15% of rock volume, respectively) occur as tabular and prismatic microlites only in groundmass. The second variety is abundant in the Udachnaya-Zapadnaya pipe. Phlogopite consists 15-20% of rock and occurs as deformed tabular xenocrysts and undeformed phenocrysts. The third variety occurs in autoliths from the Udachnaya-Zapadnaya pipe. Bulk phlogopite (up to 30% of rock) is represented by plates in groundmass. Ore minerals of all varieties are spinel, perovskite and ilmenite. Pyropes, picroilmenite and chromite are present as accessory minerals.

Basaltic kimberlites from the Udachny mine consist mostly of olivine-monticellites. Phlogopite is sporadically present as xeno- and phenocrysts. Ore minerals are spinel, perovskite, and ilmenite. Pyrope, picroilmenite, chrome diopside, orthopyroxene and chromite occur as accessory minerals.

Sr and O isotopic studies of basaltic kimberlites gave low $^{87}\text{Sr}/^{86}\text{Sr}$ ratios (0.7042-0.7047), which are typical of those from other kimberlite localities and of primitive or slightly depleted mantle. Clinopyroxene-phlogopite kimberlites

are similar to basaltic type in Sr isotopy. Their Rb-Sr ages are 352 m.y. Structurally brecciated and fluidal phlogopite kimberlites have higher $^{87}\text{Sr}/^{86}\text{Sr}$ ratios (0.7054-0.7090) with $\delta^{18}\text{O}$ values ranging from 16.2 to 22.6‰. Rb-Sr ages of the former are 345 ± 5 m.y.

Phlogopite phenocrysts occurring in both basaltic and phlogopite kimberlites show low initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratios (0.7040-0.7050) and variable Rb/Sr ratios (50, 200), which suggest their crystallization from isotopically homogeneous melt under different physico-chemical conditions.

Phlogopite xenocrysts do not form their own isochrone. At the moment of kimberlite body formation they had $^{87}\text{Sr}/^{86}\text{Sr}$ ratios > 0.8 , characteristic for alkaline rocks of the platform basement.

The obtained data indicate the initially common mantle source for all kimberlite varieties from the Udachny mine and mixed mantle-crust origin of phlogopite kimberlites from the Udachnaya-Zapadnaya pipe.