

PETROGENETIC VARIABILITY OF THE EASTERN KAMCHATKA PERIDOTITES: EVIDENCE FROM WHOLE-ROCK AND MINERAL CHEMISTRY

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Mantle-derived peridotites were collected from ultramafic massifs located within the Eastern Kamchatka ophiolite belt. The ultramafics were mostly harzburgites and with minor dunites and lherzolites. The range of variation of mineral composition is significant and corresponds to ultramafics from (1) a mid-ocean range; and (2) a suprasubduction setting. The main indicative patterns for Group 1 peridotites are: elevated Al_2O_3 in pyroxenes coupled with low $\text{Cr}/(\text{Cr}+\text{Al})$ ratios of spinels. Group 2 peridotites are characterized by reduced Al_2O_3 in orthopyroxenes and extremely high $\text{Cr}/(\text{Cr}+\text{Al})$ ratios of spinels. The primary Cr-spinel composition, estimated on basis of empirical equation, represents Cr#-values 39-57 and 61-74 for Groups 1 and 2 peridotites, respectively. Group 1 peridotites have elevated Al and Na content coupled with Ba and detectable HREE enrichments. Samples display negative Os, Ir and positive Pt and Au anomalies. Group 2 peridotites exhibit strong bulk-rock depletions in Na, K, and Al, coupled with elevated Ca/Al and Ca/Ti ratios. The ultramafics display high-depleted U-shape REE spectrum coupled with negative Th and positive Ba and Ta anomalies on chondrite-normalized plots. The platinum-group element (PGE) distribution indicates a significant depletion in all PGEs with Os/Pd ratio above chondrite values. Interpretation of these data associates a spatial combination of ultramafic tectonites of two different types within an accretion structure of the Eastern Kamchatka. Group 1 peridotites, associated with high-Ti metamorphosed tholeiites, indicate a mantle residual complex of pre-Cretaceous oceanic terrain. Group 2 peridotites are represented by high-depleted suprasubduction mantle restites, which are co-genetic with low-Ti cumulative gabbro and volcanics with a boninitic tendency. As expected, the Eastern Kamchatka suprasubduction ophiolites were formed on a peridotite oceanic basement.