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Primitive sulfide and silicate melts of the olivine-phyric basalts from the Kamchatsky Mys

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Volcanic rocks from ophiolites of Kamchatsky Mys (Kamchatka, Russia) were earlier identified as a product of the Hawaiian plume activity in the Cretaceous (Portnyagin et al., 2008, 2009). Olivine-phyric basalts found among them in 2012 (Savelyev et al., 2018) are unique because, despite their age, they contain fresh high-Mg olivine (up to Fo90) with partly crystallized inclusions of sulfide and silicate melts. Silicate melt inclusions were analyzed after reheating experiments, which allowed us to reconstruct the primary composition of melts, their crystallization and generation conditions. Temperature and oxygen fugacity of crystallization are typical for primitive MORB melts – ~1250 degrees celsius and ΔQFM $\approx$ 0 log units, while the trace element patterns of melts reflect highly heterogeneous source enrichment from D-DMM to OIB-like values. New high-precision data on the noble metals and other trace elements are obtained for the homogenized sulfide melt inclusions and separate sulfide phases – intermediate solid solution (ISS) and monosulfide solid solution (MSS). Obtained data can be used for modeling of sulfide saturation in primitive oceanic magmas and redistribution of noble metals and other trace elements during that process. This study was funded by the Russian Science Foundation grant #16-17-10145.

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