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Metal phases in an oxidized mantle peridotite xenolith from Avacha volcano of Kamchatka arc

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Mantle-wedge peridotites have been modified by various melts and fluids from subducting slab, and show oxidized conditions relative to peridotites from the oceanic floor and continental rift zones. Peridotite xenoliths from Avacha volcano, the Kamchatka arc, have been metasomatized to various extents by SiO_2-rich melts and fluids, and most of them nominally show highly oxidized conditions (ΔFMQ = -0.2 to +1.9). Among such an oxidized Avacha peridotite suite, *metallic minerals* were found in one highly metasomatized and oxidized peridotite xenolith (ΔFMQ = +1.2 to +1.9) composed of fine-grained minerals. The metal phases include native Ni, an Fe silicide (Fe-Si-Ti), native Fe, and native Ti, and the peridotite also contains Fe diarsenide ($FeAs_2$; löllingite) and Ni-rich monosulfide solid solutions (MSS). The metal phases are subangular to rectangle, and mostly smaller than 15 μm across. Ni metal is the most common among the metal phases in the peridotite, and some of them are included in olivine and others are disseminated in extremely fine-grained part composed of olivine, secondary orthopyroxene, chromian spinel with or without clinopyroxene, and amphiboles. The Fe silicide forms inclusion trails with pyroxenes (clinopyroxene and orthopyroxene), and their TiO_2 contents are low (< 0.04 wt%). The two-pyroxene thermometer (Wells 1977) using the inclusion pyroxene pair, forming inclusion trails with Fe silicide, yields $\approx$ 1040 ºC. Our finding of the metallic minerals among relatively oxidized wedge mantle imply that reducing fluids (or melts) released from subducting slab are sporadically active within the mantle wedge.