

## Reevaluation of the origin of mafic layers in the Upper Zone of the Horoman Peridotite

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Horoman peridotite is situated at the southern tip of the Hidaka mountain range, spreads 8 km east-west, 10 km north-south, and has a layer thickness of 3,000 m. We reevaluated the origin of the mafic layer in the Upper Zone of the Horoman Peridotite. We studied Fumo section in the Upper Zone. This section has total thickness of 263 m and consists of plagioclase lherzolite, harzburgite and mafic layer. In the Fumo section, the mafic layer is only interlayered in the plagioclase lherzolite. In the Al<sub>2</sub>O<sub>3</sub>, CaO, and Na<sub>2</sub>O vs. MgO diagrams of whole rock compositions, the mafic layer is plotted on the extension of the linear composition trend indicated by plagioclase lherzolite and harzburgite. There are two types of mafic layer, one plotted in the vicinity of N-MORB and the other plotted in the vicinity of plagioclase lherzolite. The plagioclase lherzolites which have higher Al<sub>2</sub>O<sub>3</sub>, CaO, and Na<sub>2</sub>O and lower MgO contents than the Depleted MORB Mantle (DMM) [1] contain amphiboles whereas the other plagioclase lherzolite which has lower Al<sub>2</sub>O<sub>3</sub>, CaO, and Na<sub>2</sub>O contents and higher MgO content than the DMM do not contain amphibole. Chondrite-normalized whole rock rare earth element (REE) patterns of plagioclase lherzolites are flat from heavy REE to middle REE and show convex upward pattern with depletion in light REE. The mafic layers also show the similar pattern although the abundances of REE is much lower than N-MORB.

From these results, the mafic layers in the Fumo section do not have the composition of primary melt and is considered to be cumulate [2,3]. Also, in the whole rock FeO, TiO<sub>2</sub> vs. MgO diagrams, the compositional trends suddenly bend at the most fertile plagioclase lherzolite and becomes depleted in FeO, TiO<sub>2</sub> toward the thin mafic layers. On the extension of this bent trends reach to the composition of Cpx and plagioclase. The mafic layer in the Fumo section suggests the possibility that Cpx and plagioclase were crystallized from a melt penetrated into plagioclase lherzolite in a relatively low pressure where the combination of Cpx and plagioclase was stable.

[1] Workman and Hart, 2005, *EPSL*, 231, 53-72. [2] Shiotani and Niida, 1997, *Memoir. Geol. Soc. Japan*, 47, 123-137. [3] Takazawa et al., 1999, *J. Petrol.*, 40, 1827-1851.

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