

Large ultramafic body regionally serpentinized in the forearc mantle; an example from the Ust'-Belaya ophiolite, Far East Russia

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Hattori & Guillot (2003) proposed that serpentinites in the forearc mantle wedge plays an important role as a sink for water and fluid-soluble elements (As, Sb, Sr, LREE) and their dehydration is contributed to the formation of volcanic front based on bulk rock chemistry of serpentinites. Because the natural serpentinites we can get on the surface of the Earth has experienced progressive change of the P-T condition, we need to know what elements are trapped in respective mineral phases not only by bulk rock chemistry but also by mineral chemistry with careful observation of the rock texture.

Ust'-Belaya ophiolite is exposed in the 80 km x 40 km area on the south of Ust'-Belaya (N65 30', E173 17'), Far East Russia (Sokolov et al., 2003). The associated limestone suggests Devonian or older age of this ophiolite. The main body of peridotite (25 km x 15 km) crops out in the northern part of the area and is composed mainly of harzburgite/lherzolite, cut by dunite and/or pyroxenite bodies. The harzburgite/lherzolite is divided into two groups; anhydrous and hydrous. The anhydrous group shows granular texture and consists of olivine, orthopyroxene, clinopyroxene and spinel, with minor amounts of amphibole and chlorite replacing pyroxene and spinel, respectively. The hydrous group is divided into three subgroups based on their mineral assemblages; (1) olivine + antigorite + chlorite +/- secondary clinopyroxene, (2) olivine + antigorite + amphibole + chlorite and (3) olivine + amphibole + chlorite +/- talc, with or without relict minerals. In some of antigorite bearing peridotites olivine shows an apparent 'cleavage'.

The peridotites from Ust'-Belaya ophiolite experienced hydration processes and their petrographical features resemble those of the peridotites from Mariana forearc (Ohara & Ishii, 1998). In this study, we report the petrographical features and mineral chemistry of the peridotite from Ust'-Belaya ophiolite and discuss about the origin of the ophiolite and mobility of the elements during serpentinization (hydration).