

Deformation structure of the Uenzaru ultramafic complex, the Hidaka metamorphic belt, Hokkaido, Japan

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The Uenzaru ultramafic rocks, located in the northern part of the Hidaka Metamorphic Belt, consist of dunite, harzburgite, websterite, lherzolite and plagioclase lherzomite, and are distributed from west to east. These rocks are strongly deformed and show a porphyroclast texture called mylonite. Foliation in the mylonite dips steeply toward the east and is almost vertical in the western part. It faces toward the east in the eastern part of the complex. Some minor structures such as mylonite foliation, lineation and minor fold axes tend to show N-S trend over the whole the studied area. The major structure of the Uenzaru ultramafic complex in the present surveyed area has an overall N-S pattern.

Microstructures that have developed in the complex are mylonitic and cataclastic textures, with former texture destroyed by formation of the latter. Asymmetric deformational microstructures can be observed in the mylonite. Based on the above-mentioned structure, the shear sense of the mylonitization consists of the following. There has been right-lateral shear movement from the west to the central parts and to the right, and left-lateral shear movements have occurred in the complex. Both right and left-lateral shear senses have been formed under N-S trend compressive stress field on the basis of lattice preferred orientation of olivine in the mylonite.

The mean size of the fine olivine grains ranges from 7.6 μm to 29.6 μm , with the size tending to decrease in the east. The dislocation density of coarse and fine olivine grains ranges from $1.6 \times 10^7 \mu\text{m}^{-2}$ to $8.6 \times 10^7 \mu\text{m}^{-2}$, with the density tending to increase in the east. Deformed pyroxene is strongly elongated in the east. These deformational elements indicate that the eastern part of the complex has deformed under higher stress than the western part.

The uplift-processes of the Uenzaru ultramafic complex can be summarized as follows.

During uplift, the mylonite of the Uenzaru ultramafic complex was formed in a N-S trend compressive stress field with right-lateral sense of shear in ductile deformation zone. Subsequently cataclastic was formed in an E-W trend compressive stress field in brittle zone. Finally, the complex has serpentinized, but without deformation.