

Mylonitization of the middle tonalite of the Hidaka Metamorphic Belt in the Satsunai-gawa River area, Hokkaido

Kohei Nishiyama[1]; Tsuyoshi Toyoshima[2]

[1] Geology, Niigata Univ.; [2] Grad. Sch. Sci. & Tech., Niigata Univ.

Many narrow mylonite zones have been found in the middle tonalite of the Hidaka Metamorphic Belt in the Satsunai-gawa River area, Hokkaido. We recognize three stages of mylonitization in the area: M1, M2 and M3. Mylonitization during the M1 and M2 stages was caused by a dextral sense of shear. Intensity of mylonitization gradually and symmetrically decreases towards both borders of the M1-mylonite zones. The mylonitic foliation near the borders commences at an angle of ca 45° to the orientation of the M1-mylonite zone, bends into near parallelism with the shear direction (C plane) in the center of the mylonite zone, and shows a sigmoidal arrangement. Most of the M1-mylonites are derived from heterogeneous biotite tonalites rich in mica content. Therefore it is possible that large volume and highly oriented fabric of mica would have led to geometric softening and enhanced strain localization during the M1-mylonitization. Fine-grained granitic veins and quartz-epidote veins have intruded along the mica-rich M1-mylonite zones. The M2-mylonitization has occurred just around these veins and resulted in very narrow mylonite zones. The M2-mylonite zones are in direct contact with non- or very weakly mylonitized wall rocks (tonalites). In the M2-mylonite zones, mylonitic textures change not gradually but sharply from their center to borders. The intrusion of these veins might have given rise to reaction softening and strain localization during the M2-mylonitization. The M3-mylonitization was caused by a sinistral sense of shear. The M3-mylonite zone is accompanied by pseudotachylytes. Three stages of mylonitization may suggest mechanical changes with decrease in temperature.