

Mylonitization of gabbro and tonalite in the Hidaka metamorphic belt from the Pankenushi-gawa River area, Hokkaido

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Pankenushi gabbroic intrusion (Maeda, 1981) from the upper reaches of Pankenushi-gawa River area in the northern part of the Hidaka metamorphic belt, Hokkaido, Japan, has suffered mylonitization in the lower crust (e.g. Toyoshima et al., 1997). The mylonites in the western (lower) part of the gabbroic intrusion have already been reported, but not yet in the eastern (upper) part. We present an example of plastic strain localization in the lower crustal conditions, on the basis of field and microscopic observations of gabbro mylonites and tonalite mylonites in the eastern part.

The oldest intrusion in the study area is pyroxene gabbro, intruded by olivine gabbro, tonalite, and then diorite. The former two mafic intrusions are of the Pankenushi body. The diorite is the youngest intrusion, hardly suffered by mylonitization.

Many narrower mylonite zones, which were derived from the gabbro and tonalite intrusions, are found in the eastern part, although the gabbro mylonite zone of the western (lower) part is less than 1km of width but extends to ca. 35km in the N-S direction. The narrow mylonite zones are heterogeneously concentrated in the eastern part and form a larger geological map-scale mylonite zone with less than 100m wide. Mylonite textures do not so gradually change from ultramylonites to almost non-mylonitized intrusives

There are NNW-SSE and ENE-WSW trending mylonite zones in the eastern part. The former zones were formed through dextral shearing, but the latter zones through sinistral shearing.

In the mylonite zones of the eastern part, development of mylonitic fabrics have been controlled and enhanced by mineral compositions and lithology of the original rocks. Mylonitization occurred preferentially and remarkably in the biotite-rich lithology in the tonalite intrusion. Geometry of mylonitic fabrics has been affected by preexisting structures such as lithologic boundary, older mylonitic foliation, and shape preferred orientation of euhedral minerals in original rocks such as magmatic flow structure.