

Metasomatic banding and deformation instability in the metamorphic rocks

*mitsuhiro toriumi¹

1. Japan agency of marine science and technology

Low grade metamorphic rocks formed in the plate boundary commonly show mineral bands composed of albite, amphiboles, chlorite and epidote in basic schists, and of chlorite, albite and quartz in pelitic schists. These bands are almost monomineralic and bimineralic and parallel to subparallel against schistosity plane. Judging from the orientation of bands nearly normal to the maximum stress direction, it seems that the banding is derived from compaction banding/porosity banding induced from the non-linearity of microcrack plasticity (Toriumi and Hara, 1995), elastic modulus (Fortin et al., 2009) and preferred orientation growth of chlorite and actinolite.

In this model, the low grade metamorphic rocks deform accompanied with progressive banding of low porosity and with migration of water vertical to the banding, and it induces stability change of solution and metamorphic minerals. Chlorite may favor the compaction bands but albite does porous bands. This type of yielding should lower the yield stress and then the deformation instability may occur in the metasomatic process in the plate boundary rocks.

Toriumi, M., and Hara, E., 1995, *Tectonophysics*, 245,249-261

Fortin, J., Stanchits, S., Dresen, G., Gueguen, Y., 2009, *PAGEO*, Doi 10.1007/s00024-009-0479-0

Keywords: metamorphic banding, compaction banding, deformation instability