

Origin of the garnet amphibolites from the Mitsuishi area, western Hokkaido Japan -constraints from the metamorphic petrology and structural analysis-

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Kamuikotan high P/T metamorphic rocks preserve one of the coldest geotherm (0.6 –0.8 GPa/°C) in the Jurassic subduction zone in circum Pacific orogenic belt. The Kamuikotan metamorphic rocks distribute as a belt extending north-south directions in central-western Hokkaido Japan. They suffered blueschist and subsequent greenschist facies metamorphism. However, the origin of the garnet amphibolites is still debatable because they suffered relatively higher P and T conditions, and exhibits as blocks in the serpentinites. Ueda et al. (2013) and Ueda & Orihashi (2014, 2015) have revealed several important new discoveries as follows, 1) origin of the garnet amphibolites are subducted warm oceanic crust 2) they overprinted blueschist facies metamorphism. Based on these important contribution of Ueda`s work, we have described garnet amphibolite blocks. Additional new things are follows. 1) Garnet amphibolites had reached amphibole decomposition temperature fields, producing rutile and zircons. 2) Garnets have relative high Ca core and Ca poor rims. 3) The garnet amphibolite blocks suffered L-tectonite (constrictional) type strain during cooling stage. Amphibole and white mica were rotated along YZ axis and garnets had overgrown and recrystallized showing snowball and S shape structure in the YZ sections. Above these features suggest that garnet amphibolites were separated from subducted crustal layers in dehydration/melting process, and that hydration and constrictional strain process were operated during exhumation stage in cold subduction zone.

Keywords: high grade blocks in serpentinite, dehydrated warm blocks into cold subduction zone, constrictional strain in exhumation