ザクロ石–普通角閃石コロナから求めた明るい岬の等温減圧経路

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Isothermal decompression P-T path of Akarui Point deduced from garnet-hornblende corona

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The Lützow-Holm Complex, East Antarctica, shows clockwise pressure-temperature paths. One of the significant evidence to support it is the reaction microstructure recognized in ultramafic rocks, in which garnet in ultramafic rocks is rimmed by symplectite composed of spinel, plagioclase and orthopyroxene (Hiroi *et al*., 1986). Combining other features in pelitic rocks, Hiroi et al. (1986) proposed a clockwise *P-T* path that includes a prograde transition from kyanite-stable to sillimanite-stable conditions, followed by decompression that is responsible for breakdown of garnet. This study deals with the reaction microstructure described by Hiroi et al. (1986) in Akarui Point, and estimates quantitative *P-T* path.

The microstructure is the symplectite composed of orthopyroxene, spinel and plagioclase that occurs between matrix hornblende and garnet porphyroblasts. Hornblende crystals occur also within the symplectite. All mafic minerals within the symplectite have compositional gradient that Mg/Fe increases with increasing distance from garnet. Ikeda (2012) interpreted this microstructure that the original composition of garnet and hornblende before corona formation was preserved at the core of garnet and hornblende grains far from garnet, and that the grains of hornblende, spinel, orthopyroxene and plagioclase that are in contact with garnet have been in equilibrated with the rim of garnet at the end of corona formation. This study estimate P-T condition when the corona ceased to grow, using the latter coexistence.

Geothermometry applied to garnet-hornblende pairs equilibrated before and at the end of corona formation indicates that both stages show similar temperature of ca. 660 ^{o}C. Thermodynamic consideration for the condition at the end of corona formation suggests that the corona began to form at <5.3 kbar and ceased to grow at 4.1 kbar during isothermal decompression. Combined with the peak metamoprhic conditions of 7.2-7.5 kbar, 750 ^{o}C at low-grade areas of the complex (Hiroi *et al*., 1983), this result confirms the conclusion of the previous works that suggested a clockwise P-T path of the Lützow-Holm Complex.

References

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