

# セール・ロンダーネ山地小指尾根、ヘグボマイト含有スカルンの鉱物共生とその意義

志村俊昭<sup>1</sup>、大和田正明<sup>2</sup>、柚原雅樹<sup>3</sup>、亀井淳志<sup>4</sup>、東田和弘<sup>5</sup>

<sup>1</sup>新潟大学

<sup>2</sup>山口大学

<sup>3</sup>福岡大学

<sup>4</sup>島根大学

<sup>5</sup>名古屋大学

## Mineral paragenesis and its implications in the högbomite-bearing skarn, Sør Rondane Mountains, East Antarctica

Toshiaki Shimura (Niigata Univ), Masaaki Owada (Yamaguchi Univ), Masaki Yuhara (Fukuoka Univ), Atsushi Kamei (Shimane Univ), Kazuhiro Tsukada (Nagoya Univ)

T. Shimura<sup>1</sup>, M. Owada<sup>2</sup>, M. Yuhara<sup>3</sup>, A. Kamei<sup>4</sup>, K. Tsukada<sup>5</sup>, A. I. S. Kemp<sup>6</sup> and T. Hokada<sup>7</sup>

<sup>1</sup>Niigata University

<sup>2</sup>Yamaguchi University

<sup>3</sup>Fukuoka University

<sup>4</sup>Shimane University

<sup>5</sup>Nagoya University

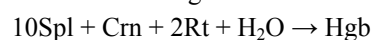
The metamorphic rocks in the Sør Rondane Mountains underwent amphibolite to granulite facies metamorphism (Shiraishi et al. 1991). Högbomite-group minerals are complex Fe-Mg-Zn-Al-Ti oxides related to the spinel-group minerals. Their polysomatic structure is composed of spinel (*S*) and nolanite (*N*) modules (Armbruster 2002; Hejny and Armbruster 2002). We (JARE-50) found a högbomite bearing skarn at the Koyubi-Ridge area of the Brattnipene, central part of Sør Rondane Mountains, East Antarctica (Shimura et al., 2011). This högbomite have been approved as a new mineral (new polysome) as magnesiohögbomite-2N4S, by the Commission on New Minerals, Nomenclature and Classification of the International Mineralogical Association (no. 2010-084) (Shimura et al. 2011).

The skarn outcrop is located within the amphibolite facies - granulite facies metamorphic layers, which contain an interbedded dolomitic impure marble layer. The marble layer is about 30 m thick. The skarn appears along the lower (north) boundary of the marble layer. The skarn zone is about 3-10 m wide, and the following types of rocks are recognized;

- (A) Impure marble (Dol ± Phl ± Tr)
- (B) Spl + Fo ± Phl ± Dol ± Gk skarn
- (C) Spl + Phl ± Tr ± Hgb skarn
- (D) Spl + Crn + Hgb + Clc + Phl skarn
- (E) Calc-silicate gneiss (Dol + Tr)
- (F) Granitic gneiss (Bt + Pl + Qtz ± Kfs)
- (G) Biotite gneiss (Bt + Pl + Qtz + Kfs)

Abbreviations of minerals are after Whitney and Evans (2010). The skarn sequences of (A)-(B)-(C) or (A)-(B)-(D) can be recognized from the marble bed to the center of the skarn zone. A sequence of (C)-(E)-(F)-(G) is also recognized from the skarn zone to the biotite gneiss layer. This mineral paragenesis can be explained by TiO<sub>2</sub>-MgO-Al<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub>-H<sub>2</sub>O (TMASH) system. The zonation is reflecting the difference in the whole rock composition; these are Ca-Mg rich portion (A and B), Al-rich and Si-poor portion (C and D), and Si-rich portion (E, F, and G). This may be reflecting the difference in the diffusion rate of each element.

The following reactions are recognized in (D).



Magnesiohögbomite-2N4S must have formed during the retrograde metamorphic stage in the Sør Rondane Mountains.

### References

Armbruster, T. (2002) Revised nomenclature of högbomite, nigerite, and taaffeite minerals. *European Journal of Mineralogy*, **14**, 389-395.

- Hejny, C. and Armbruster, T. (2002) Polysomatism in högbomite: the crystal structures of 10*T*, 12*H*, 14*T*, and 24*R* polysomes. *American Mineralogist*, **87**, 277-292.
- Shimura, T., Akai, J., Lazic, B., Armbruster, T., Kamei, A., Tsukada, K., Owada, M. and Yuhara, M. (2011) Magnesiumhögbomite-2*N*4*S* from the central Sør Rondane Mountains, East Antarctica. *American Mineralogist* (in press).
- Shiraishi, K., Asami, M., Ishizuka, H., Kojima, H., Kojima, S., Osanai, Y., Sakiyama, T., Takahashi, Y., Yamazaki, M., and Yoshikura, S. (1991) Geology and metamorphism of the Sør Rondane Mountains, East Antarctica. In Y. Yoshida, K. Kaminuma and K. Shiraishi, Eds., *Recent Progress in Antarctic Earth Science*. 77-82. TERRAPUB, Tokyo.
- Whitney, D. L. and Evans, B. (2010) Abbreviations for names of rock-forming minerals. *American Mineralogist*, **95**, 185-187.