Japan Geoscience Union Meeting 2010
(May 23-28 2010 at Makuhari, Chiba, Japan)

SCG082-P10 Room: Convention Hall Time: May 24 17:15-18:45

Basaltic dikes from southwestern part of the Sor Rondane Mountains, East Antarctica

Masaaki Owada[1*], Atsushi Kamei[2], Toshiaki Shimura[3], Masaki Yuhara[4], Kazuhiro Tsukada[5]

[1]Yamaguchi University, [2]Shimane University, [3]Niigata University, [4]Fukuoka University, [5]Nagoya University

The Sor Rondane Mountains was situated within the collision zone between West and East Gondwana. The mountains are made up of high-grade metamorphic rocks and various kinds of intrusive rocks. The metamorphic and magmatic processes in this region lead to understand formation of the Gondwana supercontinent in the deep crustal level. However, relationships between magma activities and tectonic setting during collision and dispersion of the Gondwana supercontinent are poorly understood. In this paper, we address geochemical study of basaltic dikes from the southwestern part of the Sor Rondane Mountains. The petrological investigation gives us important information to understand the crustal evolution of the Gondwana supercontinent.

Geology of the Sor Rondane Mountains consists of two metamorphic terranes, North East terrane (NE terrane) and South West terran (SW terrane), bounded by Sor Rondane Suture (SRS) (Osanai et al., 1992). The metamorphic rocks from NE terrane are composed of granulite facies rocks and ocean related crust in their protolith. On the other hand, SW terrane comprise amphibolite facies rocks with geochemical signature similar to continental margin. East ? west trending large shear zone, named Main Shear Zone appears in SW terrane c. 20 km south from SRS. Petrological and geochronological study revealed that subduction related magmatism occurred at Proterozoic (100 0 ~ 900 Ma) prior to continental collision, followed by high-grade metamorphic event corresponding with the collision-type metamorphism during 650 ~ 570 Ma (Shiraishi et al., 2008).

Intrusive rocks in SW terrane include Proterozoic matatonalite and metagranite showing metamorphic and deformational texture, and Early Palaeozoic non-deformed granite. In addition, non-deformed basaltic dikes, basalt and lamprophyre, intrude all metamorphic and igneous rocks exposed on SW terrane. We found basalt dikes and lamprophyer with vesicle filled by carbonate or clay minerals. SiO2 contents of these dikes possess 47 to 54 wt%, and are plotted within the field of alkaline in TAS diagram. Lamprophyre is characterized by high concentration of K2O up to 8 wt%, and basalt is rich in TiO2 content (2.5 to 3.5 wt%).

Basalt dikes and lamprophyre described here possess specific chemical composition similar to Karoo dolerite in South Africa. Karoo dolerite is believed to be plume related magma at the time of breakup of the Gondwana supercontinent. Considering mode of occurrence and geochemical signature, the basaltic dikes can be correlated with Karoo dolerite in Antarctic side.

Keywords: Gondwana supercontinent, East Antarctica, Sor Rondane Mountains, Basaltic dike, Karoo dolerite, Breakup of Gondwana