G123-017 **Room: 301B** **Time: May 16 14:45-15:00**

Metamorphic records inferred for the high-grade rocks from Austkampane in the central Sor Rondane Mountains, East Antarctica

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Late Neoproterozoic to Cambrian age magmatic and high-grade metamorphic terranes comprise the area more than 1000 km along the coast or the inland of central to eastern part of Dronning Maud Land in East Antarctica (Shiraishi et al., 2008, GSL SP-308, 21-67). Among those, the Sor Rondane Mountains consist of greenschist-facies through amphibolite-facies to granulite-facies metamorphic rocks from which quite complicated P-T trajectories including two-stages of heating accompanied by two-stages of decompression have been estimated (Asami et al., 1992, In: Recent Progress in Antarctic Earth Science, 7-15). The Sor Rondane Mountains can be subdivided into at least two areas - the NE and the SW Terranes (Osanai et al., 1992, In: Recent Progress in Antarctic Earth Science, 17-27), and the attempt to unravel the metamorphic records in each area has been made by several authors (Osanai et al., 2008, Abstract GSJ Annual Meeting; Baba et al., 2008, Abstract GSJ Annual Meeting; Adachi et al., 2008, Abstract GSJ Annual Meeting).

Here we provide some new consideration of the P-T evolution in the Austkampane area where is the granulite-facies part of the Sor Rondane Mountains. In this area, hornblende-biotite-bearing felsic orthogneiss and garnet-biotite and garnet-sillimanite-bearing metapelitic gneisses are predominant along with mafic-ultramafic rocks, marble-calc-silicates, orthoamphibole-cordierite-gneiss and leucocratic and granitic intrusive veins. Recent SHRIMP and EMP U-Pb dates suggest that the c.650 Ma metamorphic event in this area.

Garnet-sillimanite-cordierite and orthopyroxene-orthoamphibole-cordierite gneisses in Austkampane suggest the following petrograhical constraints:

(1) Garnet in the garnet-sillimanite gneiss commonly includes Zn-bearing spinel (up to 24wt% ZnO) which is commonly associated with sillimanite, cordierite and biotite. Other inclusions in garnet are quartz, biotite, sillimanite, rutile, ilmenite, biotite+rutile, biotite+sillimanite, biotite-staurolite, biotite+quartz and biotite+corundum+quartz aggregates. The close association of Zn-rich spinel inclusions with sillimanite might be the suggestive of the presence of earlier staurolite and the staurolite-breakdown reaction in the sillimanite-stability field.

(2) Porphyroblastic garnet crystals in the garnet-sillimanite-cordierite gneiss are commonly surrounded by cordierite corona with or without quartz and biotite. Cordierite also occurs replacing biotite+sillimanite aggregates. These textural features suggest that the pressure dropped at the cordierite-sillimanite-stability field in the temperature above 600 C. Development of the cordierite corona around garnet is conformable with the first event of two-stages of decompression proposed by Asami et al. (1992).

(3) Orthoamphibole (anthophylitic) in orthopyroxene-orthoamphibole-cordierite gneiss has Al2O3 content commonly less than 4-5 wt% down to 1-2 wt% in the rim. Rare relic core suggests relatively higher Al2O3 up to 8-14 wt% (gedritic), and this compositional change is consistent with the pressure drops estimated above.

The above observation suggests that the Austkampane area recorded the clockwise P-T trajectory started with the prograde staurolite break down reaction in the sillimanite-stability field followed by the decompression of garnet(+sillimanite) to form cordierite(+quartz+biotite). Clockwise P-T trajectory obtained here for Austkampane is contrary to counter-clockwise P-T path reported for the nearby Brattnipane area (Baba et al., 2008, Abstract GSJ Annual Meeting, Owada et al., 2008, Abstract GSJ Annual Meeting) where is 30km southwest of Austkampane; both in the granulite-facies area of the Sor Rondane Mountains. Further investigation combined with geochronology would clarify the significance of this discrepancy for the evolution of granulite-facies part of the Sor Rondane Mountains and further on to the formation of Gondwana.