2016 年度 第 3 回

日時 : 6 月 1 日（水）16 時 30 分～

場所 : 総合研究棟 B 棟 110 教室

EARTH EVOLUTION SCIENCES UNIVERSITY OF TSUKUBA
筑波大学 地球進化科学

地質学セミナー

Pressure-Temperature evolution of cordierite gneiss from Ihosy, southern Madagascar

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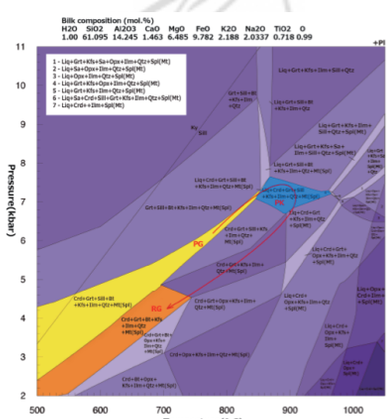
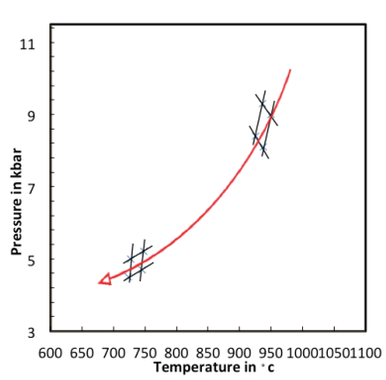
The Pan-African tectono-metamorphic event occurred between 700 and 450 Ma, and can be traced back to records in almost every continent (e.g., Africa, South America, Antarctica, India, Australia, Sri Lanka and Madagascar), mostly with deformation, intrusive activities and metamorphic overprints. Dominant collisional event of the orogeny took place at 500-600 Ma, which corresponds to the final stage of the amalgamation of Gondwana supercontinent. Madagascar located in Indian Ocean, offshore Mozambique, is mostly composed of Precambrian basement rocks formed by Mesoarchean to Neoproterozoic thermal events and Pan-African metamorphic overprint (ca. 550 Ma). In southeastern Madagascar, two major shear zones have been reported; the Ifanadiana/Ranotsara Shear Zone and the Betsimisaraka suture, and the former cuts the latter. This is similar to the situation in southern India where Palghat-Cauvery and Achankovil Shear Zones are reported, and the Ranotsara Shear Zone has been regarded as a continuation of the Achankovil Shear Zone.

The sampling area at Ihosy is situated close to the Ranotsara shear zone and belongs to the Betroka belt. Here, migmatitic cordierite-bearing pelitic gneisses are well exposed at numerous localities. A large active quarry at Colline de Lalanandro, located east of Ihosy town, has been chosen for detailed sampling and petrological work. Dominant lithologies of the locality are cordierite gneiss (cordierite + garnet + quartz + biotite + sillimanite + spinel + plagioclase + K-feldspar + ilmenite + magnetite) and Hbl-bearing orthogneiss (biotite + quartz + plagioclase + calcic amphibole + magnetite).

Petrographical observation and mineral composition analysis showed that cordierite gneiss from Ihosy experienced three metamorphic stages of evolution: prograde metamorphic stage (with the iconic mineral assemblage of Grt+Bt+Sill+Crd+ Qtz+Pl+Kfs+Mag (Spl)+Ilm); peak metamorphic stage (Grt+Crd+Sill+Qtz+Pl+Kfs+Mag(Spl)+Ilm); and retrograde stage (Bt+Grt+Crd+Qtz+Pl+Kfs+Mag(Spl)+Ilm). Phase equilibria modeling of the rock indicate that the peak metamorphic conditions are T = 850-980°C and P = 7-8 bar, which are consistent with the results of conventional geothermobarometry (950-1030°C and 7-8 kbar) . The retrograde conditions was inferred as T= 600-750°C and P= 3-5 kbar, which are also coincident with the results of geothermobarometric calculations (725-750°C and 4.2-5.2 kbar) .

Similar peak and retrograde P-T conditions have been obtained for cordierite-bearing gneiss from the Achankovil Suture Zone in southern India (e.g., Ishii et al., 2006; Shimizu et al., 2008), that confirms the Ranotsara Shear Zone is a continuation of the Achankovil Suture Zone.





Ihosy,MGK2-5i	pseudosection	geothermobarometers
Peak conditions	7-8kbar 850-980° c	8.1-9.6kbar 920-950° c
Retrograde conditions	3-5kbar 600-750° c	4.2-5.2kbar 725-750° c

次回のお知らせ　日時 : 6 月 08 日（水）17 時～　場所 : 総合研究棟 B110

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