

Petrology of igneous rocks from the Conrad rise, southern Indian ocean

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The Conrad rise is considered to be one of the Cretaceous Large Igneous Provinces and/or of hotspots at the southern Indian ocean. However, several plate reconstruction models denied the hotpot origin because hot spot tracks associated with the Conrad rise are not clearly established. Furthermore, only one petrological investigation had been performed by Borisova et al. (1996), which reported chemical compositions including major and minor compositions similar to those from the Keruguelen plateau. They concluded that the Conrad rise is hotspot of origin. However, no lines of direct evidence are revealed to explain the hotspot or mantle plume of origin. We had a research cruise KH-10-7 (R/V Hakuho-maru), and we dredged igneous, granitic and metamorphic rocks from the Ob and Lena seamounts, the Conrad rise.

Metamorphic and granitic rocks up to 30 kg are dredged from eastern slope of the Ob seamount. Some metamorphic rocks contains the Crd-Spl symplectite indicating isothermal decompression (Gnt + Sil to Crd + Spl) under the equilibrium temperature of 700 to 750°C during the clockwise P-T evolution (Ishizuka et al., 2011). Furthermore, Ishizuka et al (2011) reported monazite CHIME and zircon U-Pb age about 1000 Ma.

Igneous rocks are mostly alkalic classified into basalt and trachy-basalt with minor amount of more alkali-rich igneous rocks. Borisova et al. (1996) reported igneous rocks from trachy-basalt to trachyte. Therefore, igneous rocks from the Conrad rise have wide compositional variations from alkalic basalt ($\text{SiO}_2=44$ wt%) to tracheae ($\text{SiO}_2>60\%$). Such compositional variations of the Conrad rise could not be explained by fractional crystallization of basaltic magma unlike those of the Kerguelen plateau (ODP Leg 120 and 183) or Ethiopia continental rift (e.g. Natali et al., 2011). Furthermore, igneous rocks from the Conrda rise contain pyroxenitic and gabbroic xenolith originated from lower crust or upper mantle. These lines of evidences might constrain the tectonic origin of the Conrad rise.

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