

Vertical structural variation of a granite-porphyry intrusion of the Kumano acidic rock observed in the Kumano drilling core

Nobuo Geshi[1]; Takashi Nakajima[2]; Hironao Shinjoe[3]; Tomoaki Sumii[4]; Daisuke Miura[5]; Naoji Koizumi[1]

[1] GSJ, AIST; [2] GSJ; [3] Fac. Business Administration, TKU; [4] IGS,GSJ,AIST; [5] CRIEPI

A continuous rock sample of Kumano granite porphyry intrusion was collected from a borehole in the north body of the Miocene Kumano acidic rock, southwest Japan arc. This core sample exhibits internal structure of the granite porphyry intrusion and here we will report the preliminary result about the undergoing structural and petrological analysis. Kumano granite porphyry intrusion is a sill-like body intruding into a welded tuff layer which erupted just prior to the formation of the Kumano granite porphyry. The thickness of the granite porphyry is considered to exceed 1 km at the drilling site (Nakajima et al, this conference). Kumano core corresponds lower 465 m of the intrusion containing the bottom intrusion plane.

Lower intrusion boundary of Kumano granite porphyry is exposed at 464.25 m deep and the granite porphyry contacts against the host welded tuff with about 10 m thick chilled margin, in which the granite porphyry has very-fine groundmass and show reddish-colored. The host welded tuff also shows greenish color within about 10 m from the contact, indicating the thermal effect from the granite porphyry. These relationships clearly indicate the intrusion of granite porphyry magma into the welded tuff.

Petrographic character of the granite porphyry body is almost homogeneous. Quartz, plagioclase, alkali feldspar crystals with max 10 mm are contained as phenocryst. Orthopyroxene and biotite crystals are also contained as smaller phenocryst. Most of the orthopyroxene and other mafic crystals are replaced with secondary minerals. Xenocryst of cordierite, andalusite and garnet are observed. Size and contents of phenocryst is almost constant through the core sample. Many xenoliths and mafic magmatic enclaves are observed in the granite porphyry. Mafic enclave consists mainly of porphyritic andesite and gabbro. Xenolith consists of various type of metamorphic rock.

Groundmass texture of the granite porphyry shows systematic variation along the core. Within about 20 m from the contact, groundmass consists of very-fine crystals and entirely shows volcanic rock texture. Above 150m, groundmass consists mainly of quartz and plagioclase crystals and shows equigranular texture. In the upper part (less than 300m deep), groundmass shows graphic texture with quartz and alkali feldspar. The vertical variation of the groundmass texture indicates upward movement of interstitial vapor-rich fluid during the cooling of the sill from its basement. Granite porphyry have numerous small interstitial void and their number density and size increase upward along the core. This also indicates the rise and concentration of vapor and fluid phases during the solidification process.

Magnetic susceptibility of the granite porphyry ranges $0.3 - 1.2 \times 10^{-3}$ SI and almost constant through the core sample, although minor fluctuation is recognized. Anisotropy of magnetic susceptibility at the basement of the granite porphyry body indicates an intrusion direction from SSE to NNW direction.