

Petrological Studies of Nanzaki Basanites, Sothern Part of Izu Peninsula, Japan

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We present the result of petrographical, petrological and geochemical studies of the Nanzaki nepheline basanites found at the margin of Izu Peninsula, Japan. This alkali volcanic (0.43Ma) is located close (~15km) to the present volcanic front of Izu volcanic arc.

Petrographical observations show that phenocryst minerals are mostly clinopyroxene, olivine, plagioclase, magnetite, apatite and nepheline. Nepheline is normally observed at the lower margin of the layered lava flows, and scarcely seen in the upper non-layered lava. Based on EPMA analyses, olivine Fo content is 88-90%. Clinopyroxene has wide variations from calcic to subcalcic. Some grains of nepheline were analysed. They contain relatively high CaO content (wt.% =0.9-1.6%), compared to those found in SW Japan arc.

Major element contents are as follows: SiO₂ wt.% =41.7-44.3, MgO wt.% =11.0-12.1, K₂O+Na₂O wt.% =2-4%. Relatively high content of CaO (wt.% =12.1-13.4%), low content of K₂O (wt.% <1%), and low FeO*/MgO (=0.82-0.88) are the characteristic features, compared to some alkaline volcanic rocks in the SW Japan volcanic arc.

Incompatible trace elements variation patterns show some similarity with alkaline volcanic rocks in oceanic islands, but remarkably different from island-arc volcanic rocks. These patterns are also slightly different from alkaline rocks of SW Japan arc. We will discuss these petrographical, chemical and isotopic characteristics to clarify the origin and genesis of basanite magma, based on comparisons with alkaline volcanic rocks in SW Japan arc, and some oceanic islands.

Keywords: Basanite Magma, Alkaline volcanic rock, Nepheline, Incompatible trace elements, Sr, Nd Isotope