

Field occurrence and chemical compositions of granodiorite porphyrites in west coast of the Noko Island, eastern part of northern Kyushu

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The granodiorite porphyrite dykes are intruded into metamorphic rocks distributed in west coast of Noko Island, eastern part of northern Kyushu. Karakida (1965) and Karakida et al. (1994) thought that they are member of the Kitazaki Tonalite, one of the Cretaceous granitic rocks in northern Kyushu, based on their features. These dykes include many mafic enclaves.

The granodiorite porphyrites are massive and porphyritic biotite –hornblende granodiorite porphyrite, and composed of mainly plagioclase, hornblende, biotite, quartz, K-feldspar with trace amounts of apatite, titanite, zircon and opaques as accessory minerals. Plagioclase, hornblende, biotite, quartz are phenocryst. Quartz phenocrysts show corroded form. Plagioclase phenocrysts have dusty zone. Mafic enclaves are composed of mainly plagioclase, hornblende, biotite, quartz with trace amounts of apatite, titanite, zircon and opaques as accessory minerals. Plagioclase, hornblende, biotite and trace amounts of quartz are phenocryst. Quartz phenocrysts show corroded form and corona. Plagioclase phenocrysts have dusty zone. These textures of phenocrysts suggest magma mixing.

SiO₂ contents of the granodiorite porphyrite and mafic enclave range from 66.4 to 68.4 and from 60.4 to 61.3 wt.%, respectively. The granodiorite porphyrites have chemical compositions between mafic enclaves and granite porphyrites (Yuhara et al., 2007) intruded into the Kitazaki Tonalite. Most of chemical compositions of mafic enclaves in the granodiorite porphyrite are within that of the Kitazaki Tonalite. But, abundance of MgO, Na₂O and Cr are higher, and Y is lower than that of the Kitazaki Tonalite. The granodiorite porphyrite has been formed by mixing of this magma, which is origin of mafic enclaves, and granite porphyrite magma.

Keywords: granodiorite porphyrite, Kitazaki Tonalite, Noko Island, Cretaceous granitic rocks in northern Kyushu