

Petrography and correlation of schistose clasts from the Aso-4 pyroclastic flow deposit

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The pre-Neogene basement rocks are widely covered by Quaternary volcanic deposits in middle Kyushu, therefore it is difficult to detect geotectonic zoning there. In this study, we have found a clue to detected subsurface geology by using accidental clasts included in the Aso-4 pyroclastic deposits on the east of the Aso caldera.

62 clasts isolated from the exposures of the Aso-4 pyroclastic flow deposit are collected along the upper stream of the Onigajo River in the Namino Plateau. The collected clasts are dominantly composed of actinolite rock (50), and subsidiary of actinolite-talc schist, talc schist, websterite, biotite hornfels, cpx-plagioclase rock, opx-quartz schist, quartz-cpx schist, and quartzose rock.

These clasts can be divided lithologically into three groups: (1) metasomatic rocks; actinolite rock, actinolite-talc schist, talc schist. (2) ultramafic and mafic rocks; websterite, cpx-plagioclase rock, opx-quartz schist, quartz-cpx schist, and (3) silicicrocks; biotite hornfels, quartzose rock.

The actinolite rocks consist of oriented fine-grained aggregate of actinolite commonly forming schistosity. Some of them are nephrite appearance. The actinolite rocks are highly possibly formed by metasomatic interaction between serpentinite or serpentized peridotite and silicic rocks (Harlow and Sorencen, 2005). The metasomatism needs fluid transport along the contact between serpentinite and silicic rocks. Schistose structure can be made by this fluid flow and such metasomatic reaction (Harlow and Sorencen, 2005, Nishiyama, 1989). The ultramafic clasts also have foliation and lineation such as oriented chlorite corona around chromian spinel and oriented diopside. The biotite hornfels clasts are composed of fine-grained biotite, quartz, plagioclase, chlorite and K-feldspar and banded structure derived from protolith sediments exists.

For the petrography of the clasts described above, and the existence of the mylonitic granite clasts, which correlative with the Nioki granite in Asaji metamorphic terrane, from the Aso-4 pyroclastic flow deposit on the north of Aso caldera (Takagi et al., 2007), the actinolitic rocks with hornfels clasts are correlative with the metasomatic rocks in the Asaji metamorphic terrane where large serpentinite body exposed with low P/T metamorphics.

Keywords: Aso-4 pyroclastic flow deposit, actinolite rock, metasomatism, ultramafic rock, Asaji metamorphic terrane