[JJ] Evening Poster | S (Solid Earth Sciences) | S-GL Geology

[S-GL31]Regional geology and tectonics

convener:Takeshi Yamagata(Department of Natural Sciences, Komazawa university), Makoto Otsubo(National Institute of Advanced Industrial Science and Technology (AIST), Institute of Earthquake and Volcano Geology)

Sun. May 20, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

The main aim of this session is to discuss geologic structure and tectonic history of East Asia, especially of Japanese Islands, on the basis of the recent results of geology and other earth sciences.

[SGL31-P08]Classification and Deformation Conditions of Cataclastic Rocks in Volcanic Rocks of the Anamizu Formation in Western Noto Peninsula, Japan

*Masaya Furusho[1], Anada Fumihiro[2], Hiroshi Okumura[2], Kai Yamaguchi[1] (1.OYO Corporation, 2.Hokuriku Electric Power Company)

Keywords:cataclastic rocks, fault, volcanic rocks, microstructure, deformation temperature

The Anamizu formation in Western Noto Peninsula in Japan is distributed subhorizontally, which consists of andesite and tuff breccia at Early Miocene. Several types of cataclastic rocks commonly occur in the Anamizu formation. The cataclastic rocks are found a planar shape, and the border between the cataclastic rocks and the host rocks is not clear. Rock fragments and matrix in the cataclastic rocks are finer compared with that of host rocks. Cataclastic rock is generally formed under high temperature and pressure in the crust. Since the Anamizu formation is estimated that total thickness of 500 to 1000 m (Ozaki, 2010), it is unlikely that the cataclastic rocks are formed under such a condition. We classified this kind of cataclastic rocks based on their microstructures, and considered their deformation conditions and relation to the tectonic evolution.

The cataclastic rocks along the basal part of an andesitic lava flow show reddish-brown color due to high-temperature oxidation. The cataclastic rocks consist of rock fragments and matrix, and the rock fragment is composed of euhedral plagioclase phenocryst and matrix. The euhedral plagioclase phenocryst occasionally exhibits subgrains, microfracture with subgrains, deformation band and undulose extinction, and the groundmass contains undeformed acicular plagioclase. The matrix of the cataclastic rocks consists of plagioclase, pyroxene and alteration minerals, and deformation band, kink band and undulose extinction present in the plagioclase fragments.

The low-angled flow structures which are defined by flat and elongated breccia occur in part of tuff breccia, and it indicates that the tuff breccia is deformed relatively weak. The matrix consists of plagioclase, pyroxene and alteration minerals. The plagioclase exhibits deformation band and undulose extinction.

The steeply dipped cataclastic rocks are across a flow unit of andesite and tuff breccia. The cataclastic rocks show grayish color due to hydrothermal alteration. In further detail, some cataclastic rocks accompanied with fractures, containing a gouge, mineral vein and clastic dike. Dragged rock fragments along the fractures suggest normal faulting. The cataclastic rocks consist of rock fragments and matrix. The matrix is a fine grained aggregate of plagioclase, pyroxene and alteration minerals. Plagioclase in the matrix is various grain size and angler shape, and showing deformation band, kink band, deformation twinning and undulose extinction.

From the above, we supposed that the cataclastic rocks along the basal part of a andesitic lava flow represent flow-foot-breccia. The flow structures in a part of tuff breccia are caused by compaction. The steeply dipped cataclastic rocks are a fault rocks which were collapsed at the extension tectonics at Early Miocene. Furthermore, the microstructures of plagioclase in these cataclastic rocks imply that dominant deformation temperature is about 300 to 400°C (Passchier and Trouw, 1996) . The flow-foot-breccia and the flow structure in the tuff breccia are formed during extrusion and sedimentation of the Anamizu formation, therefore, the steeply dipped fault also inferred to deform at the similar tectonic environment to the others. The cataclastic rocks can be formed in shallow involving high geothermal gradient and hydrothermal process, if they deformed at volcanism period relate to expanding the Sea of Japan at Early Miocene.