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The Geodynamic Mechanism of Eocene Large-Scale Felsic Volcanism in Eastern Nyainqentanghla Fault-Uplift

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1 Formation of Volcanic Rock

The rhyolitic magma activity is the oriental part of the volcanic rock, but it ended up with the activity of shoshonitic rocks. The occurrence of shoshonite is the sign of intracontinental magmatism (Mo et al., 2003). The distribution of REE which show the character of LREE enrich, the obvious fractionation, HREE relatively depleted and the not so distinctive fractionation but the negative Eu exception express that: mafic magma have a certain influence on the rhyolite formation. However, it is difficult to explain the short-time exploration of hot magma and pyroclastic flow in large scale using the fractionation of mafic magma. Besides, the character that rhyolitic volcanic lava is riched in Th and LREE, have the similar spider diagram with continental crust which illustrate the tendency of partial melting as well as continental crust contamination all support the point that Volcanic rock of eastern Nyainqentanghla fault-uplift is related to the remelting of crust. Volcanic rock belongs to the K-rich volcanic rock. K-rich volcanic rock normally cannot generate via partial melting of mantle peridotite. These kinds of rock must have crust

material to participate during the diagenesis (Qiu et al., 2003).

The locations of sample in volcanic rock are in or close to the abyssal sediment. According to the analysis, in the research field, the lithosphere mantle hybridized by the fluid generated due to the oceanic crust subducted into the mantle. But the sample just locate near the abyssal sediments area fully prove that the K-rich volcanic rock endure slight hybridism with shallow crust material during the diagenesis and the magma chamber have the intense hybridism because of the crust material's intense subduction to mantle. Volcanic rocks have high Rb/La and U/La ratios. This proves the subduction-produced fluid's participation in the generation of magma from the source zone that is

enriched in EMI mantle. In general, the source region of the volcanic rock is mantle plume in subduction zone that has metasomatism with the subduction produced fluid.

Consequently, volcanic rock is formed by the combination of mafic magma fractionation in the mantle subduction zone with the silicic magma due to continental crust remelting.

2 Tectonics

The volcanic rock mainly contains the rhyolitic rocks that include a large amount of volcanoclastic rock. Basalt, Andesite and trachyte can also be found in the volcanic rock. It belongs to the cal-alkali and high-K cal-alkali rock. The distribution pattern of REE is LREE rich, negative Eu exceptional. The degree of LREE fractionation is higher than the HREE. The trace element distribution normalized by primitive mantle shows highly enrichment of LILE such as Rb, Ba, K and radioactive element Th and relatively depletion in Sr, Ta and Ti. The character of REEs and trace elements are similar to the modern island arc and active continental margin volcanic rock. They are generated in the late period of the volcanic activity due to the northern subduction of the Neo-Tethys oceanic crust. It occurs in the back arc area. In addition, the volcanic rocks contain the trachyte that is a kind of alkalic rock. All above-mentioned shows that the volcanic activity was in the later or last period of the tectonic-magmatic cycle, the short relax time in the tectonic environment.

3 Geodynamic Mechanism

In ~ 55Ma, Neo-Tethys oceanic basin closed, the closed Neo-Tethys oceanic crust subducted to north continuously, Subducted slab dehydrated and formed a high-alkali and LILE-rich fluid. The upflow of these fluids lead to the partial melting of the mantle plume and generated basaltic magma. The flow up of basaltic magma makes the Lhasa landmass partial melt. As the tectonic environment was

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already the initial period of collision between Indian plate and Eurasian plate which formed thick continental crust and was not good for the eruption of volcanoes comparing with the volcanic rock in the volcanic island arc, the felsic magma erupted and only a little basaltic magma erupted. Later, it had a short period of relax. So it contains trachyte, latite and other alkali rocks. Samples in the first three sections of Pana formation located in the area of volcanic arc and syn-collisional area while the forth section only located in syn-collisional area. It means that the fourth section was already in the syn-collisional environment. Combining with the rhyolite in the Pana formation that distributed largely can have the conclusion that the tectonic setting was in the transitional tectonic setting from subduction of Neo-Tethys oceanic plate to Indian plate toward the collision with Eurasian plate. The tested data shows that age of the movement is 54Ma(Dates from regional geological survey of the 1:250000 Dangxiang Sheet by Institute of Geomechanics Chinese Academy of Geological Sciences) by SHRIMP and U-Pb isotope age test of the Trachyte ignimbrite in Pana formation using 7 test point which get a similar age. In other words, in the early period of Paleocene and Eocene, Nyainqentanghla

was still in the subduction from India Plate to Eurasian Plate, the collision of Indian plate to Asian plate begin at about 54Ma.

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