

Evolution of magmatic chemistry for the Asama-Maekake volcano since 10ka revealed by whole-rock chemical analysis of pumice obtained by the trenching of air-fall tephra deposits

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The high-resolution stratigraphy of pumice deposits, which were formed by the pumice eruptions of Asama-Maekake volcano, is revealed by the trenching. It is clarified that the pumice beds consist of twenty-three units from As1 to As23 and the eruptive history comprises three active stages (I (9.5 to 8.3ka), II (6.5 to 4.7ka) and III (1.8ka>)) and two dormant stages (1 (8.3 to 6.5ka) and 2 (4.7 to 1.8ka)). The major element chemistry for pumice clasts of each pumice bed are analyzed by XRF. The pumice of the active stage I and II are enriched in Al_2O_3 and depleted in CaO, suggesting that both suffered chemical weathering. The pumice clast of the active stage III with high MgO, which is free from chemical weathering, are also high in FeO* and MnO, and depleted in TiO_2 , P_2O_5 and Na_2O . The pumice in the active stage I and II shows also the similar tendency. The SiO_2 contents for most pumices of As15 to As22 are less than 60wt% and mafic andesite, while those of As1 to As13 are more than 60wt% and felsic andesite to dacite. The MgO content at 58wt% SiO_2 (Mg_{58}) of pumice of each pumice bed repeats the increase and decrease with time, but it appears to increase temporally as a whole. It means that the MgO content of mafic end-member magma fed to the magma chamber filled with felsic end-member magma changes with time, because the pumice of Asama-Maekake volcano is produced by the magma mixing between mafic end-member magma with various MgO contents and felsic end-member magma with similar SiO_2 and MgO contents.

Keywords: Asama-Maekake volcano, tephra stratigraphy, whole-rock chemistry