

Spatial variation of magma compositions at the Abu Monogenetic Volcano Group, SW Japan

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To mitigate volcanic hazard of volcanic fields, understanding of temporal-spatial migration of vents and evolution of magma composition is important. The Abu Monogenetic Volcano Group (AMVG) is a late Cenozoic volcanic field composed of basaltic to rhyolitic lava flows distributed over a district of 400 km². We investigated the whole rock chemical composition of these lava flows to determine the evolution of magma of the AMVG. It is known that the AMVG classified into early (2-1.6 Ma) and late (<0.8 Ma) period. In this study, we focus on the monogenetic volcanoes in the late period.

Spatial variation of magma composition shows that relatively primitive basaltic magma erupted in the east area of the AMVG, whereas, silicic magma erupted in the west area. The relatively primitive magma has features of extraordinary high Cr content (>120 ppm) and Ni content (>300 ppm), low FeO*/MgO (<=1.1). The silicic magma (SiO₂ <=60 wt%) has features of high Sr content (>600 ppm), low Y content (<= 18 ppm), and low Nb content (<16 ppm). It contains smaller amount of REE than basaltic magma, suggesting that these magmas are originated from different magma source. The chemical composition of volcanoes in the middle area can be explained by mixing of these two end members: the composition gradually changes from east (basaltic) to west (silicic).

These results suggest that magma evolution of volcanic fields is also complicated as that of stratovolcanoes. Further investigation of magma evolution at volcanic fields including the AMVG is required to understand the entire mechanism.

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