

Spatial variation for surface morphology and whole-rock chemistry of Aokigahara basaltic lava, Fuji volcano.

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A discriminating map for surface morphology of Aokigahara lava has been made based on the 3D-topographical map using the laser-profiler method (Chiba, T. et al., a paper presented in this meeting). According to the map, the Aokigahara lava erupted from sporadically aligned four volcanic centers extending over about 6km in E-W direction; they are Omuroyamanishi, Ishizuka, Nagaoyama and Koriana vent from west to east. The Omuroyamanishi volcanic center comprises more than six pyroclastic cones or lava mounds aligned in E-W direction. The Ishizuka center consists of a single lava mound or densely welded spatter cone. The Nagaoyama center is composed of four pyroclastic cones aligned in NW-SE; two of them are destroyed. Lavas erupted from the same volcanic center are grouped and named the lava group; they are Omuroyamanishi, Ishizuka, Nagaoyama and Koriana lava groups. Ishizuka and Nagaoyama lava groups overlie the Omuroyamanishi lava group. The Nagaoyama lava group overlies the Koriana lava group, which includes Tenjin and Igadono lava flows.

The surface morphology of the Aokigahara lava is classified into three types: Type-I, Type-II and Type-III. The Type-I with flat and smooth surface is similar to pahoehoe lava and consists of two sub-types: stratified and thick crust types. The stratified type, characterized by toes andropy structure, comprises a pile of thin lava units with a thickness of less than 50cm, while the thickness of a lava unit of thick crust type exceeds 1m. The specific features such as tumulus, pressure ridge, skylight and sometimes hornito are observed on the surface of the Type-I, in addition to blister and lava tube developed inside of the lava. The surface crust of most Type-I lava is ruptured and shows the surface morphology that likes slab pahoehoe. The Type-II with rough and clinkery surface resembles aa lava and consists of two sub-types: cauliflower aa and rubbly aa types. The cauliflower aa type is composed of small clinkery blocks of scoria with a size of centimeters to tens of centimeters, while the rubbly aa type comprises rounded large blocks of scoria with a diameter of more than 50cm. The Type-II lava is generally thicker than Type-I and characterized by levees, lava wrinkles and terminal cliffs. The Type-III is intermediate of Type-I and II, the surface of which resembles transitional pahoehoe or pasty pahoehoe lavas. The Type-I often changes to Type-II and III. In the Aokigahara lava, the Type-I is predominant and occupies about 74% of exposed area of the surface.

The whole-rock SiO₂ content of the Aokigahara lava ranges from 51.00 to 51.47wt% and FeO*/MgO ratio from 2.03 to 2.28. The FeO*/MgO ratio of the Omuroyamanishi and Ishizuka lava groups is less than 2.15 and different from that of Nagaoyama lava group, which exceeds 2.15. The every volcanic center erupted basaltic magmas with slightly different chemical composition, but the parental magma of them is nearly the same because their incompatible element ratios are similar. There is no particular relationship between the surface morphology and whole-rock chemistry of lavas.