

Formation Process of Inusuzumi-Yama Lava Cave System in Mt.Fuji

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Abstract: Discharge mechanism of lava-cave has been proposed and discussed based on Bingham characteristics of lava flow in the tube on both the inclined plane and the flat plane. A simple model of steady state isothermal laminar flow in circular pipe were used for Inusuzumi-Yama lava cave system formation analysis.

Flow characteristics were studied as a function of parameters such as tube radius, viscosity, yield strength of lava and inclination angle of down slope or gas pressure difference. A critical condition was obtained for determining the discharge parameters in which the yield strength plays a dominant role. Some existing data base from the observation of lava cave were introduced into the critical condition and yield strength of lava or gas pressure difference can be obtained.

The obtained yield strength of lava or gas pressure difference seems to be reasonable as a general lava flow characteristics. As a conclusion, it can be said that, for drainage of the lava flow from the tube, in the case of the inclined plane tube flow, gravity potential plays a preponderant role, in the case of the flat plane tube flow, gas pressure plays a main driving force.