

Convection in conduit: a view from analogue experiment

Miwa Kuri[1]

[1] Tohoku Univ.

Introduction:

The model that the magma convect in the volcanic conduit take from the phenomena of the excessive discharge of sulfur gas in the eruption of 2000 of Miyake Island and the possibility of the existence of the water riched primitive magma of the island arc.

We will discuss the possibility of the magma convection in the volcanic conduit based on the result of the model experiment.

Experiment:

It experiments using polyethylene glycol (PEG)600. PEG600 is the liquid of the low viscosity at the room temperature and the freezing point is about 15 degree C.

PEG600 was supplied from the bottle of 100 ml and was introduced to the vertical tube.

It introduces a tube into the discharge tank which filled with water.

The elevation of supply bottle and the diameter of tube controls discharge rate of PEG600. The temperature of the room and the water in the tank influences the viscosity of PEG600.

The elevation of supply bottle is 25 cm, 50 cm, 75 cm and 100 cm. The tube diameter is 4mm, 6mm, 8mm.

Result:

In the case of tube diameter of 4mm and 6mm, the flow of PEG600 got off the vertical tube. The flow rate for every the unit area was proportional to the elevation approximately, it is true that the result had looseness because of the viscosity change by temperature variation of room and water.

On the other hand, in the case of 8mm, the counterflow phenomenon of water was observed from the tube lower part. The flow rate is higher than the case without counterflow.