

## Petrological monitoring of eruption at Sakurajima volcano by automatic sampling system from Feb 2008

# Taketo Shimano[1]; Masato Iguchi[2]; Akihiko Yokoo[3]

[1] Fuji-Tokoha Univ.; [2] SVO; [3] SVRC, DPRI, Kyoto Univ.

There are many active volcanoes in Japan. Most of their present activities are small eruptions emitting ash particles of andesitic magma (eg. Sakurajima, Suwanosejima, Aso, and Asama). The accumulated amount of magma erupted in these long term successive activities are comparable with that of much larger historical eruptions. These ash emitting eruptions are sometimes called as strombolian or vulcanian by many researchers, but the difference among these eruption styles is not necessarily clear. The time sequence and transition patterns are also quite variable in ash eruptions. They show alternating behavior such that the intensity of eruption changes periodically. Although these ash eruptions are familiar than larger one, we do not yet fully understand the mechanisms of these eruption styles and the transition among them.

The monitoring would be essential method to understand these mechanisms. Geophysical monitoring techniques such as seismometer and GPS became powerful tools for evaluating the position and movement of magma beneath the volcano. The recent development in remote sensing and spectroscopy enabled us to estimate temporal gas emission rate. In contrast, however, monitoring of magma itself in terms of petrology is not yet established, probably because of difficulty in obtaining erupted materials.

We developed an automatic sampling machine of volcanic ash to monitor eruptive conditions of magma and surrounding rocks beneath the volcano. This machine is capable of collecting 30 ashfall samples automatically every given time interval. It works even in bad conditions such as heavy rainfall and windy storm with filter-equipped sample cases and sheltered sample case changer. The weight of this machine is only about 10 kg including lead-acid battery for 1 month operation, and it can be installed even in the area where car and electric power accesses are limited.

We have been collecting ash samples everyday (interval = 1 day) from Feb 2008 at Sakurajima volcano, southwest Japan. We set up two machines 2 km south and 4 km north of Showa crater, respectively, to achieve continuous sampling in case for wind direction change. Simultaneously, ash plume photographs are taken every 10 minutes to know vent position and plume height, and atmospheric temperature-pressure-humidity conditions are monitored in order to give some constraints on ash plume dynamics. During this observation of one year, we have obtained more than 500 time series ash samples. The amount of each sample was 0.0-3.6g. Most ash particles are less than 1 mm and some are accretionary lapilli. A characteristic sequential change is color of ash. It changes gradually from white to black and then to red in some active periods. We will continue this monitoring method and compare with other time sequential geophysical data.