

Deployment of the automatic Multi-gas stations for volcano monitoring by JMA

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In order to help to monitor volcanic activities, the automatic Multi-gas station systems are going to be deployed at four active volcanoes in Japan by JMA. This station has already been installed at Kusatsushirane and Azuma volcanos. Later this year, more two stations will be installed at two volcanoes, Kuju and Ontake.

This telemetric monitoring system was improved from the prototypal Multi-gas system which had been developed by the Advanced Industrial Science and Technology (Shinohara, 2005). This system can detect five gas components, SO₂, H₂O, CO₂, H₂ and H₂O. This station captures drifted atmosphere involving diffused volcanic gases released from fumarole by pump absorption, not by insertion of pipe to fumarole directly. Though this system cannot measure absolute value of gas concentration, this can get composition ratio based on multiple gas components. There are several studies that change of the composition ratio accompanied by volcanic activity by repeated survey (Ossaka et al., 1980). In the past, gas concentrations have not been monitored continuously by stable-maintained systems in active volcanoes in Japan, so this system is expected to accumulate effective data which contributes to evaluate volcanic activity and to detect premonitory phenomenon for phreatic eruption.

This system is needed to be installed near volcanic crater where gas is generated. At such area, power source and communication line are not prepared. So this has independent power system used solar panels and telemetry system used satellite communications. Observation is once per day and measurement time is 40 minutes at 13:00 every day for electric power saving. However, in the case of gas concentration exceeds the threshold value. Extra-measurement is done up to three times a day. Data is transmitted to headquarters of JMA immediately after measurement then it is supposed to be transferred to the MRI and AIST.

Keywords: Multi-gas system, volcanic gas, phreatic eruption