The SO2 fluxes and volcanic activities of volcanoes of Kyushu -- Measuring by DOAS (Aso, Suwanose, Sakurajima) --

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-Introduction-

The Correlation Spectrometer (COSPEC) has been used to the estimate of the SO2 flux from the volcano from the 1970's. The SO2 flux measuring device that used small UV spectrometer in recent years was developed by several groups. And, the measurement in the volcano is reported. Even we experimentally produced the small size SO2 flux measuring device. And, we started the test observation with the volcano of Japan from 2003. Because the measurement theory of quantity of the SO2 column in volcanic smoke adopted DOAS (Differential Optical Absorption Spectroscopy) method, this small size SO2 flux measuring device is named 'DOAS'.

Even the measuring methods of DOAS are panning and traverse methods similar to COSPEC. Especially the measuring position is recorded by using GPS in the traverse method. Furthermore, the transport to the summit crater became easy because the size of DOAS is small light and the walking traverse of the crater rim became possible. Thereupon, we report the result of the SO2 flux in the volcano of Kyushu (Aso, Suwanose Island, and Sakurajima) and the time variation of the volcanic gas flux. And the relation with volcanic activity is discussed.

-Aso-

The phreatic explosion (mud eruption) occurred on July 10, 2003 and January 14, 2004 in Mt. Nakadake. We are measuring the SO2 flux by using DOAS after October, 2003. The observation of the traverse and panning methods were carried out 7 times by the end of January, 2004. As a result, the SO2 flux was about 500ton/day from the Nakadake 1st crater and the SO2 flux is stabilizing throughout the observation period. On the other hand, Cl/SO4 mole ratio in volcanic ash, which was discharged by the 2 times of phreatic explosions, is showing the trend that volcanic activity become active and even the temperature inside the crater is going up. From now on, we are observing the SO2 flux and clarify the relation with volcanic activity and SO2 flux.

-Suwanose Island-

Because the mountain climbing to the crater of Suwanose Island is very hard, the observation which used COSPEC was impossible. However, we were able to measure the SO2 flux that is discharged from the crater of Suwanose Island by the use of DOAS. As a result, the SO2 flux was about 1000ton/day from the Suwanose Island crater. Furthermore, the time variation of concentration of SO2 that is included to volcanic smoke was observed. The relation between the time change of concentration of SO2 and eruptive activity, are discussed from the comparison between the data of the seismogram.

-Sakurajima-

The SO2 flux is observed by using DOAS after August, 2003 in Sakurajima and the SO2 flux was about 1000ton/day. At present, the volcanic activity of Sakurajima is low and explosions occur about only several times in the month. The SO2 flux of 2000-5000ton/day is reported in the past, with the observation that used COSPEC. Even the result of the SO2 flux is suggesting that present volcanic activity of Sakurajima is low.