



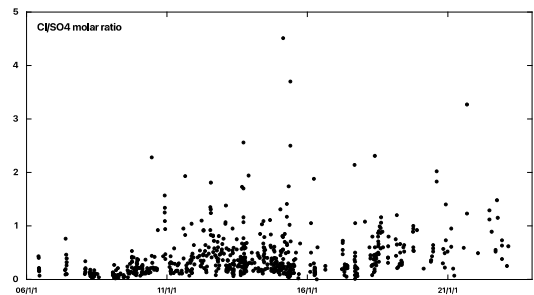
Investigation of active volcano by geochemical method

Multidisciplinary Resilience Research Center

<http://www.ksvo.titech.ac.jp/jpn/index.html>

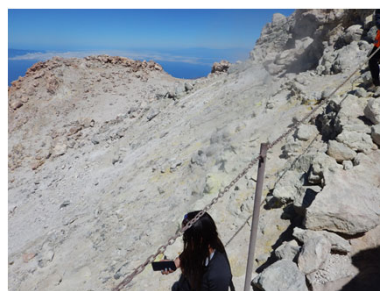
- Research on the degassing of volatiles from magma
- Monitoring of insular and submarine volcanoes

Magma is a silicate melt containing volatile components such as H_2O , CO_2 , S, Cl, F, etc. When the pressure decreases as the magma rises, the volatile components that have reached saturation degas from the magma and are released into the atmosphere as fumes and fumaroles. Degassed volatile components are not only the driving force behind eruptive phenomena, but also change the density and viscosity of the magma, resulting in a variety of eruptive styles. Volcanic activity is a continuous release of material and energy, and information on volcanic activity is reflected in the temperature, chemical composition and emitted amount of volcanic gases, so capturing these changes during the eruption preparation and eruption process plays an important role in understanding the eruption mechanism.



Activity on Sakurajima estimated from analysis of volcanic ash leachates

In the volcanic plume, HCl and SO_2 in the volcanic gases form water-soluble salts on the surface of volcanic ash particles. The water-soluble Cl/ SO_4 molar ratio is equal to the HCl/ SO_2 molar ratio released during eruptions, and analysis of the water-soluble components can be used to monitor volcanic activity. An increase in the Cl/ SO_4 molar ratio suggests an ascent of magma.



Volcanic gas observations at active volcanoes abroad.

- Observation of volcanic gases are performed at the summit of Mount Teide (3718 m) on Tenerife in the Canary Islands, Spain, a hotspot volcanic island, in cooperation with colleagues.
- The Canary Islands are one of the world's leading tourist destinations, visited by 15 million tourists every year, so observation research and disaster prevention based on this research is an extremely important mission.

Marine volcanic observation

- The phenomenon in which the sea surface turns milky white to yellowish brown in association with submarine volcanic activity is called discoloured seawater. In ocean areas far from land, it is difficult to observe earthquakes and ground deformation, and it is difficult to detect signs of submarine volcanic eruptions, but observation of discoloured seawater is a powerful method for deciphering submarine volcanic activity.