



Sulfur isotopic compositions of fumarolic samples from TVG hydrothermal area in northern Taiwan

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Tatun volcano group (TVG) is located in northern Taiwan. The hydrothermal activity, e.g., fumaroles and hot springs, is very active and has been considered as an active volcano. In previous study, helium isotopic results from fumarolic gas demonstrated that more than 60% of helium from the majority of sample sites exhibit mantle-derived characteristics, indicating that a magma chamber might still exist beneath the TVG area. Meanwhile, the CO₂/H₂O molar ratio of the magmatic component in the fumarolic gases of TVG also suggested the enrichment of volatiles in the magmas beneath TVG. Compared with other volcanic gases in the world, the TVG gases show the typical composition of low temperature volcanic gases, which exhibit high methane concentrations and H₂S/SO₂ ratios. It is first time to systematically study the sulfur isotopes in volcanic gas (include H₂S and SO₂), hot spring water (SO₄-2) and sulfur elements (S₈) in TVG geothermal area to better understand the source of sulfur species and the fractionation of sulfur. Preliminary results of the $\delta^{34}\text{S}$ ratios of H₂S gas from fumaroles fall in the range of -4.45 ‰ to 5.38 ‰ indicating that there are multiple sources for the sulfur species in studied area. In this study, we will further discuss the spatial distribution of $\delta^{34}\text{S}$ values and possible fractionation of sulfur isotopes among different sample types of fumarolic gas, spring water and sulfur elements in TVG geothermal area.