

Is the volcanic gas discharged on the summit of Mt.Mihara, Izu-Ohshima useful for prediction of the eruption ?

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Fumarolic gases were sampled on the summit of Mt. Mihara, Izu-Ohshima volcanic island, Japan in 2004 and 2005. The chemical and isotopic composition were determined. The fumarolic gas was a mixture of air, water vapor and carbon dioxide. No hydrogen gas was detected. The relationship between CO₂/H₂O ratio and oxygen isotope ratio of H₂O enables us to estimate the process of the formation of fumarolic gas. The first step of the process is the mixing between a magmatic gas and a steam originates in meteoric groundwater or sea water. The fraction of magmatic water at the mixing is estimated to be 7 to 14% and 2 to 5% in the cases where the counterpart is meteoric ground water and sea water, respectively. The mixture is cooled during the travel to surface. About 70 to 86% of water vapor in the mixture is condensed and lost. The remained water vapor is mixed with air and discharged as fumarolic gas of 56 to 67C. The oxygen isotopic ratio of H₂O in fumarolic gas is expected to increase and H₂ gas would be detected in fumarolic gas, responding the increase in the flux of magmatic gas. The monitoring of the fumarolic gas will contribute the prediction of the next eruption of volcano.