

Use of a classical technique for monitoring of gases of fumaroles at Poás Volcano, Costa Rica

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From June to July, 2004, thanks to the JICA cooperation and by means of Dr. Takeshi Ohba (Kusatsu- Shirane Volcano Observatory), the geochemistry personnel of the Volcanological and Seismological Observatory of Costa Rica (OVSICORI-UNA) received training for sampling and analysis of fumarolic gases. The visited volcanoes were Poás, Turrialba, Irazú, Rincón de la Vieja and Miravalles. Since then, the relative concentration of fumarolic gases of important Costa Rica active volcanoes is monitored as a main part of our routine laboratory and field work. The gases are sampled with a two-mouth syringe containing a KOH solution. The acid gases (e.g. H₂S, SO₂, HCl and CO₂) are absorbed by the solution and then analyzed by wet chemistry following a very careful but simple procedure. From these samples, H₂S and SO₂ are quantified as total sulfur. The so-named residual gases (H₂, He, N₂, O₂, Ar, CH₄, CO), as a bulk, are quantified by volume difference and separated from the liquid phase for posterior analysis by gas chromatography. Corresponding samples are collected in KI-KIO₃ for the determination of the SO₂/H₂S ratio. The characterization of volcanic systems with the use of this methodology has been already demonstrated (Ohba, 1997, 1994). Showing the utility of a classical but very precise technique, here we report the results of the fumarole gas measurements from June 2004 to March 2005 for the Poás Volcano, including a deviation study of the sampling. We compare the results with 2003 measurements (TIT-CCVG, 2003) and correlate the data with seismic, photographical and the Poás acid crater lake information generated at OVSICORI.

References

- Ohba, T., Hirabayashi, J., Yoshida, M., 1994. Equilibrium temperature and redox state of volcanic gas at Unzen volcano, Japan. *J. of Volcanology and Geothermal Research* 60, 263-272.
- Ohba, T., Nogami, K., Hirabayashi, J., 1997. Hidrotermal System of the Kirishima Volcanic Area Inferred from the chemical and isotopic composition of spring waters and fumarolic gases. *Bull. Volcanol. Soc. Japan.* 42, No.1, 1-15.