



Halogen chemistry in volcanic plumes

N. Bobrowski (1), I. Louban (1), O. I. Whaba (1); A. Aiuppa (2), S. Inguaggiato (3) and U. Platt (1)

(1) Institut für Umweltphysik, Heidelberg, Germany, (2) University of Palermo, Palermo, Italy, (3) INGV, Palermo, Italy

nbobrows@iup.uni-heidelberg.de / Fax +49 6221 546405 / +49 6221 546529

BrO was for the first time detected in the volcanic plume of Soufriere Hills Volcano, Montserrat in May 2002. Further research was carried out over the last two years at several volcanic sites in Central and South America and Europe. Mini-MAX-DOAS (MultiAXis Differential Optical Absorption Spectroscopy) was applied to investigate the chemical composition and its variability and chemical transformation processes of volcanic plumes. Investigations were carried out in Nicaragua at the volcanoes Masaya and Momotombo, in Costa Rica at Poas in March 2003, in Italy at the volcanoes Etna and Stromboli in September/October 2003 and in August-October 2004, in Chile at Villarica in November 2004 and in Bolivia at Ollague in December 2004.

The BrO level of all further observed volcanoes were lower than in the plume of Soufriere Hills Volcano. However, they still are a significant source. BrO was well correlated to the simultaneously measured Sulphur dioxide (SO₂) emissions at the five volcanic sites where BrO was detected. Volcanoes might be an important source of reactive halogens for the global budget and should have effects at least locally.

Etna was extensively studied over several weeks of low and enhanced activity. Measurements were done in different distances from the summit and BrO/SO₂ ratios over a time period of several weeks were investigated. The results of these experiments will be presented. Detection of chlorine and iodine oxides will also be discussed. Halogen chemistry processes in the plume will be considered including effects on the atmosphere.