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Halogen chemistry in volcanic plumes

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Bromine oxide has been measured in the plumes of several slowly erupting volcanoes. We compared field measurements from Mt. Etna, Italy with results from a one-dimensional model that was initialized with volcanic plume compositions according to a thermodynamic model. Assuming an "effective source region" where plume air is being mixed with ambient air at still high temperatures we were able to reproduce the measuremnets for BrO and SO_2 very well. The model includes a parameterization for the horizontal entrainment of background air as well as a detailed set of gas-phase and aerosol-phase reactions. We will show a comparison with data and discuss the results and possible implications of these reactions for the chemistry of the troposphere.