

# Kinetic Studies for Quantitative Elucidation of Heterogeneous Halogen Chemistry in the Troposphere

## -JpSAC Early Career Scientist Award Lecture-

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Ozone is one of the most important species in the troposphere since it has health and environmental effects, and relates to atmospheric oxidation capacity and climate change. Halogen species are deeply involved in the tropospheric ozone chemistry by forming catalytic reaction cycles. Observations, model simulations and laboratory experiments have suggested that heterogeneous reactions of gaseous oxidants such as ozone and OH radical with halide ions in sea water/ice and sea salt aerosol are important halogen emission sources. However, quantitatively we still have not had conclusions of their importance in many cases due to experimental difficulties to determine kinetic parameters for the heterogeneous reactions. To obtain quantitative kinetic parameters of gas-liquid heterogeneous oxidation reactions of halide ions which are difficult for conventional methods, this study has developed original approaches using laser spectroscopy or mass spectrometry, and applied them to kinetic studies. This presentation includes results of three reaction systems: 1. gaseous ozone with iodide solution (Sakamoto et al. 2009, 2013), 2. gaseous ozone with bromide solution (Sakamoto et al. 2018a), 3. gaseous OH radical with chloride containing deliquesced aerosol (Sakamoto et al. 2018b), and also discussion on contribution of interfacial process to total reaction rate.

### References

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