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The Adsorption of HO₂NO₂ on Ice

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Nitrogen peroxides, such as peroxyntic acid (HO₂NO₂) act as reservoir for atmospheric NO_x and HO_x species and thus impact the oxidative capacity of the atmosphere. Mixing ratios of HO₂NO₂ in the range of 76 pptV have been measured in the upper troposphere. The presence of ice in cirrus clouds there may represent a major sink for HO₂NO₂, yet little is known about the partitioning to ice particles of this trace gas. In this study, the partitioning of HO₂NO₂ between the atmosphere and ice was investigated by coated wall flow tube experiments in the temperature range of -45 °C to -20 °C. The detection was done with a chemical ionization mass spectrometer, using SF₆- as ionizing species, allowing for mixing ratios of HO₂NO₂ of around 2-3 ppbV during the experiments.

The temperature dependence of the equilibrium partitioning constant of HO₂NO₂ between air and ice was determined. The partitioning of HO₂NO₂ between air and ice is compared to the IUPAC recommendations for HNO₃; the partitioning coefficients of HO₂NO₂ were found to be orders of magnitude lower than the ones for HNO₃. The adsorption of HO₂NO₂ on ice proved to be fully reversible, as determined by desorption experiments. Further, the atmospheric implications are discussed.

Please list some keywords

HNO₄

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