Geophysical Research Abstracts
Vol. 12, EGU2010-4425, 2010
EGU General Assembly 2010


# Impact of water vapour enhancement in the HNO3-forming channel of the HO2+NO reaction on global chemistry

Daniel Stone and Mathew Evans
School of Earth and Environment, University of Leeds, Woodhouse Lane, Leeds, LS2 9JT, UK

Reactions involved hydroperoxy radicals (HO2) are central to the chemistry of the troposphere. Its reaction with NO leads to O3 production, and its self-reaction provides the chain termination step for HOx chemistry for much of the atmosphere. Despite its central role in atmospheric chemistry, there are large uncertainties in the rate of some of its key reactions.

In this work we use a 3D chemistry transport model (GEOS-CHEM) to investigate the sensitivity of differing metrics of atmospheric composition (global mean OH, CH4 lifetime, O3 burden) to the differing rate constants currently in the literature for the HO2 + NO reaction and the HO2 + HO2 reaction. We compare the model output to observations. We conclude that the uncertainties in the literature rate constants lead to significant differences in the composition of the atmosphere and that further studies, especially of the impact of H2O–HO2 complexes are required.