Geophysical Research Abstracts,
Vol. 10, EGU2008-A-03004, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-03004
EGU General Assembly 2008

Model Studies of Ammonia and Nitric Acid Gases on Cloud Activation

Hui-Ming Hung (1) and Henry G. Leighton (2)

(1) Department of Atmospheric Sciences, National Taiwan University, Taiwan (hmhung@ntu.edu.tw), (2) Department of Atmospheric and Oceanic Sciences, McGill University, Canada

The effect of trace gases such as ammonia and nitric acid on cloud condensation nucleus (CCN) activation is studied systematically in terms of the mixing ratio, and equlibrium states, using an air parcel model with 81 aerosol size bins. The partition of trace gases and the growth rate of particle are assumed to be proportional to the saturation ratio difference between the air parcel saturation ratio and the equilibrium saturation ratio of the droplet estimated from the Köhler equation. The results show that the present of ammonia and nitric acid enhances CCN/CN but this effect is strongly dependent on the timing, when the trace gases participate into the aerosol particle. The cloud spectrum is also affected by the trace gas initial state and this spectrum variation will further change the cloud optical depth. We further analyze the impact of such cloud spectrum variation on climate.