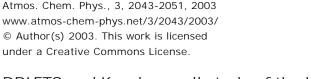
# Atmospheric Chemistry and Physics An Interactive Open Access Journal of the European Geosciences Union



# DRIFTS and Knudsen cell study of the heterogeneous reactivity of SO<sub>2</sub> and NO<sub>2</sub> on mineral dust

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Abstract. The heterogeneous oxidation of SO<sub>2</sub> by NO<sub>2</sub> on mineral dust was studied using Diffuse Reflectance Infrared Fourier Transform Spectroscopy (DRIFTS) and a Knudsen cell. This made it possible to characterise, kinetically, both the formation of sulfate and nitrate as surface products and the gas phase loss of the reactive species. The gas phase loss rate was determined to be first order in both SO<sub>2</sub> and NO<sub>2</sub>. From the DRIFTS experiment the uptake coefficient,  $\gamma$ , for the formation of sulfate was determined to be of the order of 10<sup>-10</sup> using the BET area as the reactive surface area. No significant formation of sulfate was seen in the absence of  $NO_2$ . The Knudsen cell study gave uptake coefficients of the order of  $10^{-6}$ and  $10^{-7}$  for SO<sub>2</sub> and NO<sub>2</sub> respectively. There was no significant difference in uptake when SO<sub>2</sub> or NO<sub>2</sub> were introduced individually compared to experiments in which SO<sub>2</sub> and NO<sub>2</sub> were present at the same time.

■ Final Revised Paper (PDF, 742 KB) ■ Discussion Paper (ACPD)

Citation: Ullerstam, M., Johnson, M. S., Vogt, R., and Ljungström, E.: DRIFTS and Knudsen cell study of the heterogeneous reactivity of SO2 and NO2 on mineral dust, Atmos. Chem. Phys., 3, 2043-2051, 2003. 
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