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## The interaction of N<sub>2</sub>O<sub>5</sub> with mineral dust: aerosol flow tube and Knudsen reactor studies

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**Abstract.** The interaction of mineral dust with N<sub>2</sub>O<sub>5</sub> was investigated using both airborne mineral aerosol (using an aerosol flow reactor with variable relative humidity) and bulk samples (using a Knudsen reactor at zero humidity). Both authentic (Saharan, SDCV) and synthetic dust samples (Arizona test dust, ATD and calcite, CaCO<sub>3</sub>) were used to derive reactive uptake coefficients ( $\gamma$ ). The aerosol experiments (Saharan dust only) indicated efficient uptake, with e.g. a value of  $\gamma(\text{SDCV}) = (1.3 \pm 0.2) \times 10^{-2}$  obtained at zero relative humidity. The values of  $\gamma$  obtained for bulk substrates in the Knudsen reactor studies are upper limits due to assumptions of available surface area, but were in reasonable agreement with the AFT measurements, with:  $\gamma(\text{SDCV}) = (3.7 \pm 1.2) \times 10^{-2}$ ,  $\gamma(\text{ATD}) = (2.2 \pm 0.8) \times 10^{-2}$  and  $\gamma(\text{CaCO}_3) = (5 \pm 2) \times 10^{-2}$ . The errors quoted are statistical only. The results are compared to literature values and assessed in terms of their impact on atmospheric N<sub>2</sub>O<sub>5</sub>.

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