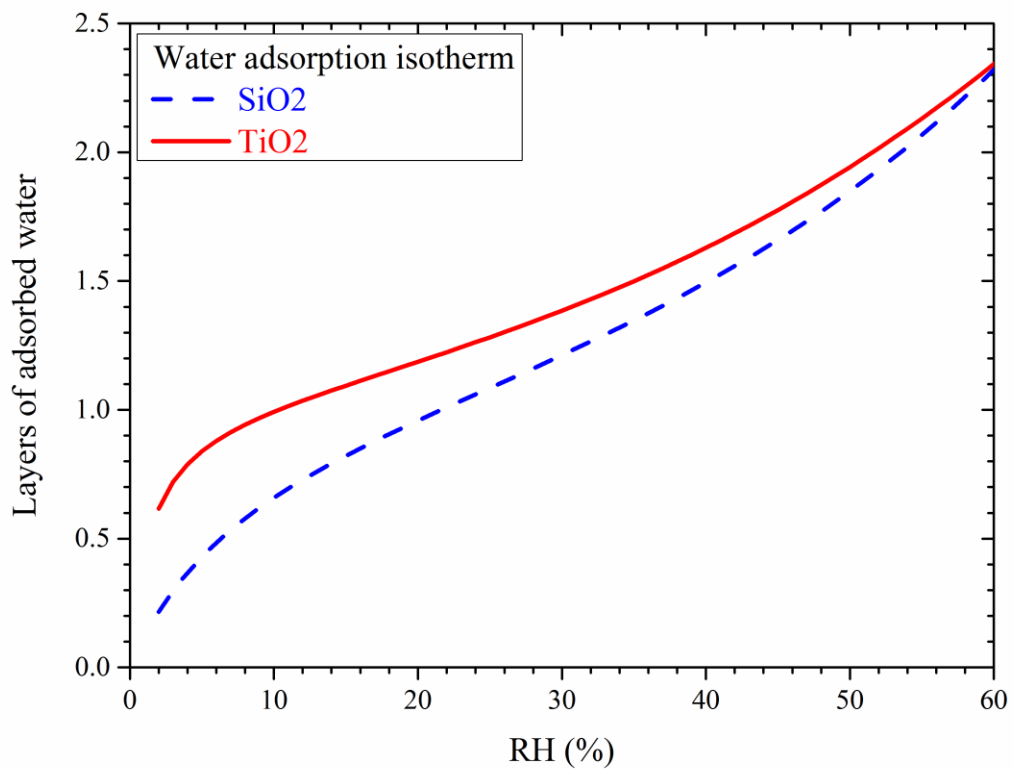
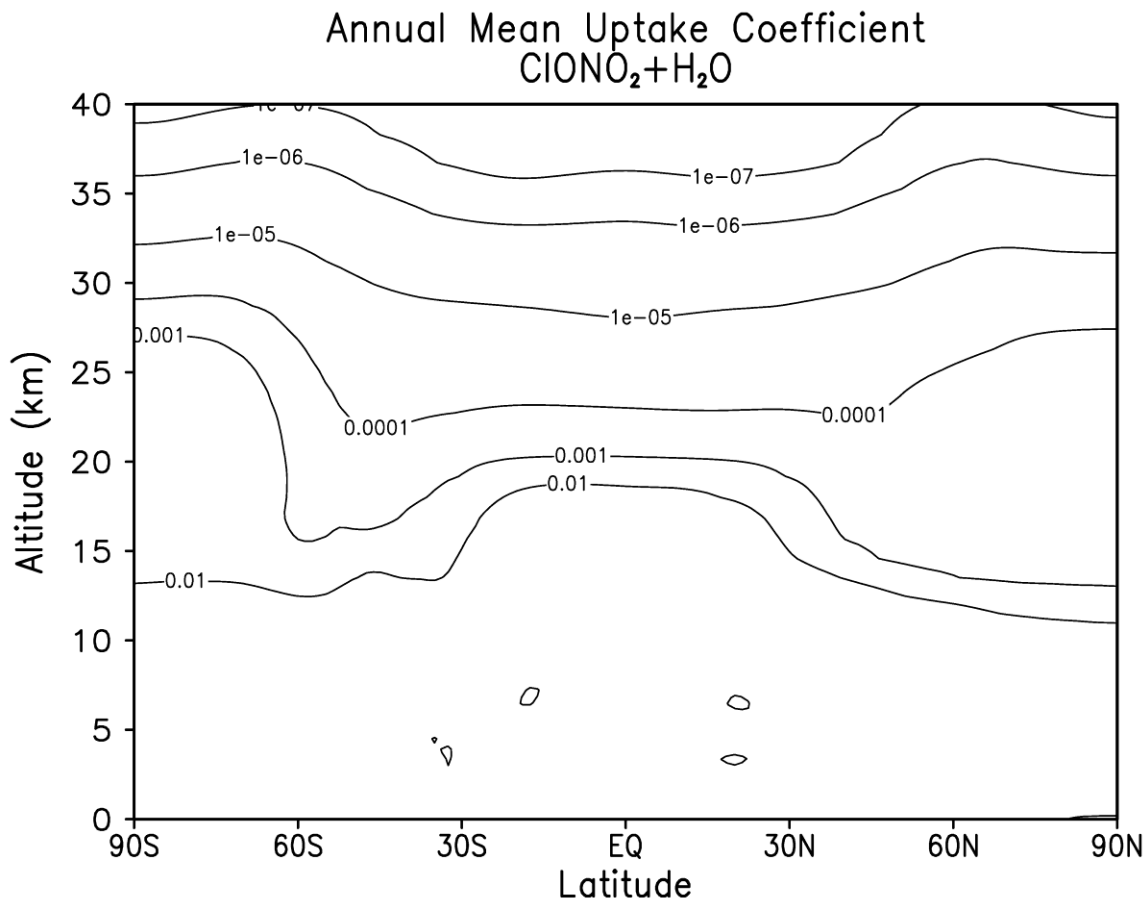
2   **Figure S1.** Typical number size distributions of SiO_2 and TiO_2 aerosol particles used in in

3   this study.

5
6   **Figure S2.** Water adsorption on SiO_2 and TiO_2 particles at different RH, reported by

7   Goodman et al. (2001).

8

9   **Figure S3.** Uptake coefficients of $ClONO_2$ on sulfuric acid particles in the stratosphere for

10   the reaction $ClONO_2 + H_2O + surface \rightarrow HNO_3 + HOCl$.

11 **Reference:**

12 Goodman, A. L., Bernard, E. T., and Grassian, V. H.: Spectroscopic study of nitric acid

13   and water adsorption on oxide particles: Enhanced nitric acid uptake kinetics in the

14   presence of adsorbed water, J. Phys. Chem. A, 105, 6443-6457, 2001.