

## Supplementary Information

### Heterogeneous uptake of gaseous hydrogen peroxide by Gobi and Saharan dust aerosols: a potential missing sink for H<sub>2</sub>O<sub>2</sub> in the troposphere

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#### 1. XPS

XPS measurements were carried out on the SCIENTA ESCA 300 instrument at the NCESS laboratory Daresbury, UK using monochromatic Al K $\alpha$  radiation and a pass energy of 150 eV. The Saharan and Gobi dusts were affixed to the sample holder by means of double-sided non-conducting adhesive tape. To eliminate sample charging due to emission of photoelectrons during spectral acquisition, the sample surface was irradiated with low energy electrons beam from a flood-gun located in the spectrometer chamber. Quoted electron binding energies are referenced to that of graphitic carbon at 284.6 eV.

#### 2. Fe 2p and Ti 2p XP Spectra for Saharan and Gobi dusts.

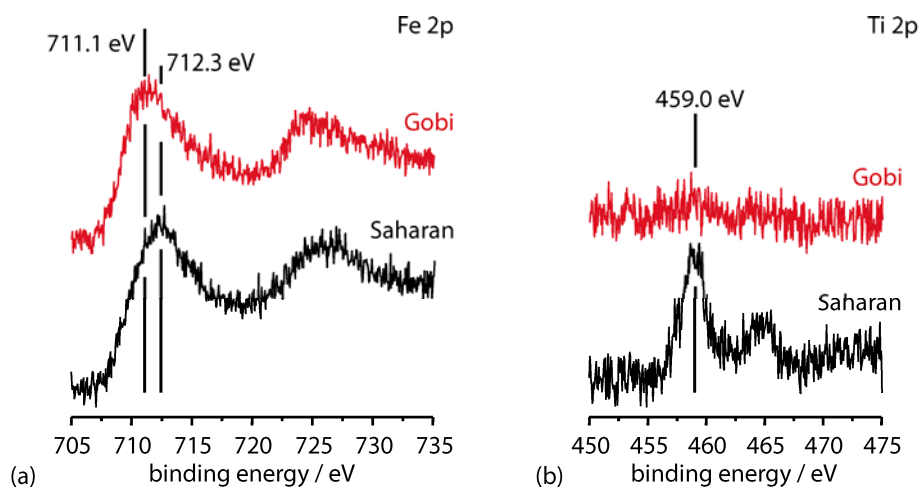


Figure S1. (a) Fe 2p<sub>3/2, 1/2</sub> XP spectra of the Gobi and Saharan dusts. The Gobi sample contains only Fe<sub>2</sub>O<sub>3</sub>. The Saharan sample also contains Fe in another chemical state, possibly as a mixed oxide incorporating Na and/or K. (b) Ti 2p<sub>3/2, 1/2</sub> XP spectra of the Gobi and Saharan dusts. Only the Saharan sample contains titanium. The Ti 2p<sub>3/2</sub> appears at a binding energy of 459.0 eV characteristic of TiO<sub>2</sub>.