Geophysical Research Abstracts, Vol. 7, 06177, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06177

Effect of light on the uptake rate of NO_2 on minerals

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The atmosphere is almost a homogeneous gas phase medium having a rich chemistry. Nevertheless, everybody has also observed at least once in his life a cloudy sky, a demonstration that small volumes of the atmosphere are occupied by condensed matter. Clouds are not unique. Indeed, the atmospheric condensed matter is heterogeneous in nature as it can be found in various states (liquid or solid) and shapes (from spherical liquid droplet to fractal soot particles).

Especially, up to 3,000 Tg of mineral aerosol are uplifted annually into the mid troposphere and transported over very large distances. This huge amount of mineral aerosol has been conjectured as being the support for the conversion or scavenging of nitrogen oxides.

Mineral dust contains small amounts of TiO_2, which has specific photocatalytic properties. We therefore studied the effect of this compound on the photoinduced transformation of nitrogen dioxide on various solid surface chosen to mimic mineral dust.

In practice, the NO_2 was diluted in nitrogen to a concentration lower than 100 ppb and was then exposed to solid TiO_2in a coated flow tube.

The preliminary measurements of the uptake rate of NO_2 on various TiO_2/SiO_2 mixes in presence of light will be presented.