Photoenhanced uptake of NO_2 on soot

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Soot was suggested to be an important sink for some atmospheric oxidants (such as O_3 or NO_x). As a consequence, its heterogeneous chemistry has been largely investigated in the past years. However, its atmospheric impact appeared to be quite limited due to a rapid soot surface passivation. As previous studies were done under dark conditions, we decided to investigate the effect of light on the uptake kinetics of NO_2 on soot.

These experiments were performed by means of a coated flow tube equipped with near-UV emitting lamps. Different combustion conditions were used to produce the soot samples. We determined the uptake coefficients for different gas phase NO_2 concentrations (15-120 ppbv) in the dark and under near UV irradiation. The results showed that the NO_2 uptake on soot is considerably enhanced under irradiation leading to NO and HONO production. Uptake coefficients increased both with soot mass and the irradiation intensity. The inverse dependence of the uptake coefficient with the NO_2 concentration, both under illumination and in the dark, was consistent with a Langmuir-Hinshelwood mechanism. HONO yields changed accordingly to the combustion conditions of soot particles.

The importance of soot photochemistry will be presented and discussed as our results suggest that photo-induced uptake may be important under atmospheric conditions.

Geochemistry constraints of Triassic–Jurassic calc-alkaline magmatism in the Sanandaj–Sirjan zone: Implications for arc magmatism in the Iranian continental margin

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Introduction

The Sanandaj-Sirjan Zone extends from the Bitlis area in Turkey to the western end of Makran, across the present – day transition zone from collision (Zagros Thrust) to subduction (Makran).

Result

Geochemical data from basalts, basaltic andesites, and andesites of the Mesozoic from Sanandaj-Sirjan Zone are shown that the rocks have variable SiO2 of approximately 46–61 wt%, Al2O3 of 15–26 wt%, and total alkali (K_2O+Na_2O) of 2–6 wt%. N-MORB-normalized trace element patterns show Sanandaj-Sirjan volcanic rocks have a geochemical pattern similar to that found for other continental arcs, with enrichment in LILE relative to HFSE and in LREE relative to HREE.

Discussion of Results

The first evidence of the subduction of the Neo- Tethyan Ocean beneath the south of the Central Iranian Block could assume at L. Triassic to L. Jurassic time. This subduction phase led to presence of volcanic activities within the Sanandaj-Sirjan Zone. Then the Sanandaj-Sirjan Zone behaved as an active continental margin, as witness by the presence of calc-alkaline Sanandaj-Sirjan Magmatic Arc (SSMA).