Chemical & Environmental Engineering

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Atmospheric Heterogeneous Reactions Between Nitric Acid and Organic Particulate Matter

Nitrous acid (HONO) in the troposphere is of great importance because it temporarily sequesters hydrogen oxides (HO_x) and nitrogen oxides (NO_x), both of which contribute to ozone (O_3) formation. Because of the high solubility of nitric acid (HNO_3), it is thought that HNO_3 acts as the major sink for NO_x in the troposphere. Previous research, however, suggests that HNO_3 can be converted to HONO in a "renoxification" process that can enhance O_3 mixing ratios further. This is supported by ambient measurements made during the Texas Air Quality Study II (TexAQS II) during the late summer of 2006 in Houston. During this field campaign, it was observed that a decrease in HNO_3 was coincident with an increase in HONO and the presence of hydrocarbon-like aerosol, presumed to be primary in nature, during morning rush hours.

To better characterize this phenomenon, a series of experiments was designed. The experiments were carried out in a 6-foot long glass flow-tube housed in a temperature-controlled room. HNO_3 concentrations were varied up to a maximum of 5 ppbv to mimic conditions during TexAQS II. The seed aerosol used in these experiments consisted of pure conventional motor oil to represent rush-hour motor vehicular emissions. Preliminary data will be shown and discussed.

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Friday June 4, 2010
9:30 - 10:30 AM
Bourns A265
Refreshments at 9:15 AM