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**Laboratory Studies of Al(2)O(3)-NO(x) Aerosols**

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**Abstract:** Laboratory experiments were performed to investigate the chemistry of **aluminum oxide** (gamma Al(2)O(3)) aerosol samples upon exposure to NO(x) (NO(x) is NO, NO(2), etc..) gases. Static aerosol samples were generated in an aerosol chamber and studied at temperatures ranging from 298 to 183 K. Fourier-transform infrared (FTIR) absorption spectroscopy was used to study the aerosol samples over time. Each aerosol was created using the same procedure. First, a reactant gas species, NO or NO(2), was added to the chamber and infrared spectra were collected over a 20-minute time interval to characterize heterogeneous reactions occurring on the chamber walls. Next, an **aluminum oxide** aerosol was generated by expanding powder into the chamber using nitrogen gas at high pressure. Infrared spectra were then collected at 6-minute intervals for at least 100 minutes to characterize Al(2)O(3)-NO(x) chemistry. The experiments reported on in this paper enabled a quantitative characterization of both the rate of reactant gas uptake and product formation processes to be performed. A quantitative (i.e., stoichiometric) analysis of reactant gas depletion and product gas formation enabled elementary reactions involving **aluminum oxide** surface hydroxyl sites and NO(x) species to be proposed. (2 tables, 2 figures, 6 refs.)

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