

PHYSICAL CHEMISTRY SEMINAR



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4:00 PM | YH 4222

Mani L. Bhaumik Collaboratory -
Dongwon Yoo Seminar & Conference Hall

Surface Chemistry on Soil, Ocean, and Snow: Impact on Atmospheric Nitrogen and Halogen Species



Abstract: Chemical reactions on ground surfaces, such as soil, snow, and ocean, can have a significant impact on the composition of the atmosphere. However, our understanding of this surface chemistry and the transport to/from the ground is still incomplete. This is, in part, because the observation of species undergoing chemistry at the surface requires analytical methods that overcome sampling artifacts and allow the determination of vertical fluxes. In addition, most atmospheric chemistry models were not designed to include chemical reactions and bidirectional fluxes at the ground.

In this presentation the significance of surface chemistry will be discussed for three different chemical systems and environments: Nitrogen chemistry in polluted urban areas impacts radical levels and thus ozone and aerosol formation. Iodine chemistry over the tropical ocean lowers background ozone concentrations in the marine boundary layer and in coastal cities. Bromine chemistry over snow is known to deplete ozone and mercury during spring. Observations with long-path Differential Optical Absorption Spectroscopy instruments, combined with high-resolution one-dimensional atmospheric chemistry and transport models elucidate the chemistry and transport processes in these environments. These results allow identification of common characteristics, uncertainties, and a better quantitative description of the influence of surface chemistry on the composition of the overlaying atmosphere.