

MAR05-2004-001132

Abstract for an Invited Paper
for the MAR05 Meeting of
the American Physical Society

Reactions at Interfaces in the Lower Atmosphere: Current Problems and Future Challenges¹

BARBARA FINLAYSON-PITTS, University of California, Irvine

It is increasingly recognized that reactions at interfaces play key roles in the chemistry of the lower atmosphere. These include reactions at air-liquid interfaces such as sea salt particles as well as processes at air-solid interfaces such as mineral dust particles. Organics from anthropogenic and biological sources are believed to be ubiquitous components of such particles. Previous studies suggest that the reaction of ozone with unsaturated organics at such interfaces is faster than expected by analogy to the gas phase reactions. We report here the results of kinetic and mechanistic studies of the reactions of gas phase ozone at room temperature with alkene self-assembled monolayers (SAMs) in the absence and presence of water vapor. A combination of attenuated total reflectance (ATR) and transmission FTIR as well as non-contact AFM was used to probe the chemistry. The kinetics, mechanisms and the implications for oxidation of organics on surfaces under atmospheric conditions, and future challenges, will be discussed.

¹Co-authors are T. M. McIntire and Y. Dubowski. We are grateful to the National Science Foundation for support of this work.