

Water Effects on Atmospheric Reactions

Joseph S. Francisco

Department of Earth and Environmental Science and Department of Chemistry

University of Pennsylvania

Philadelphia, Pennsylvania 19104

Abstract

Water has a significant impact on many processes that occur in the Earth's atmosphere. It is one of the most abundant resources in our atmosphere and, because of its ability to be both a hydrogen bond donor and acceptor, water can form very stable complexes. The formation of these complexes can dramatically affect the chemistry in the atmosphere, including heterogeneous removal and alteration of the photochemical properties of the atmospheric species, the formation of water droplets and aerosol particles, as well as the participation of complexes in chemical reactions. This talk will review both experimental and theoretical investigations of water vapor effects on gas phase reactions, with an emphasis on those pertinent to the atmosphere. A goal of the talk is to provide an understanding of the fundamental concepts underlying potential water effects, imparting a framework to better understand global effects of water chemistry in our atmosphere.