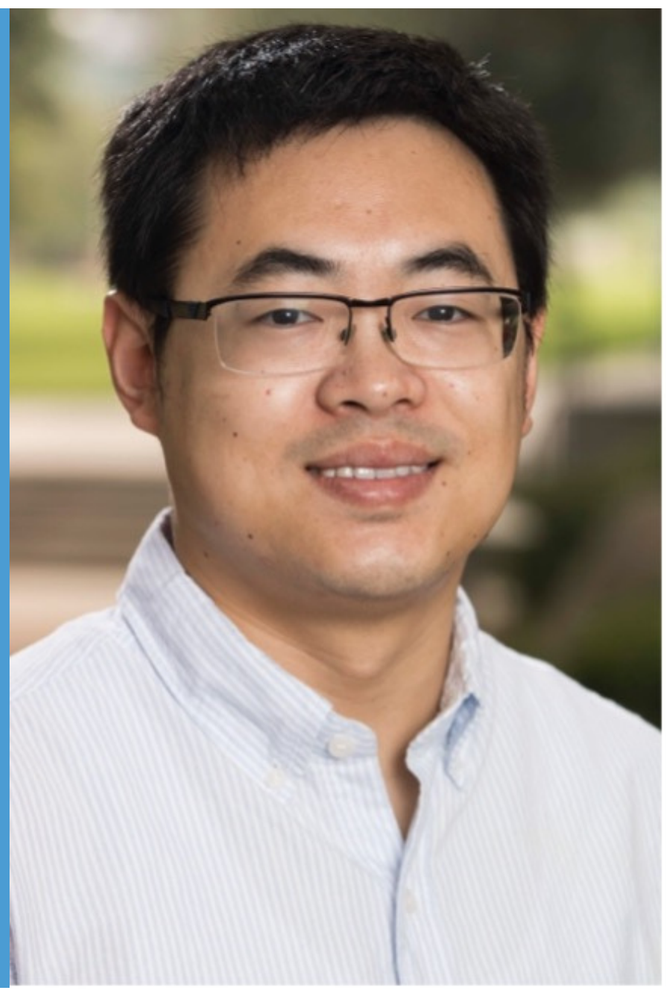
2021-2022 ANALYTICAL CHEMISTRY SEMINAR SERIES



Multiphase atmospheric chemistry: Toward deciphering the molecular composition and transformation of organic aersols in the atmosphere

Prof. Haofei Zhang

University of California-Riverside

Atmospheric organic aerosols (OA) play a crucial but poorly understood role in affecting air quality, the Earth's radiative balance, and human health. Upon their presence in the atmosphere, OA can undergo oxidative evolution throughout their lifetime. Under an oxidizing environment, OA particle interface is highly enriched with peroxy radicals (RO2) that are formed via gaseous oxidant attack. Thus, the fates of the particle interfacial RO2 largely determine the chemical composition and physiochemical properties of the OA particle interface. Therefore, it is crucial to elucidate RO2 chemistry at the particle interface to improve understandings of these impacts. Prior relevant research has focused on the RO2 self-reactions undergoing the Russell and Bennet-Summers mechanisms. Other possible interfacial RO2 pathways and their corresponding products, however, have not been sufficiently explored. In this seminar, our recent searches for additional RO2-centered pathways and products during multiphase oxidation of OA will be presented. Specifically, interfacial dimerization, peroxide chemistry, and site-specific mechanisms will be discussed. The use of a suite of mass spectrometry techniques, including chemical ionization mass spectrometry and ion mobility mass spectrometry, allows for the elucidation of the new reaction mechanisms and oxidation products. Our results provide new insights into the heterogeneous oxidation kinetics and the complex reaction mechanisms that should be updated in current climate models.

OCTOBER 25, NOON - 1:00PM
CHAPMAN 125 + ZOOM