Department of Chemical and Environmental Engineering

2016—2017 Colloquium Series

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9:30-10:30 AM

WCH 205/206

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Insights into the Atmospheric Chemistry of Isoprene from Laboratory, Field, and Modeling Studies

Abstract: About 500 Tg of isoprene is released to the atmosphere each year from Earths biosphere. Due to these large emissions, and the high reactivity of isoprene with atmospheric oxidants, the reaction cascade initiated by this single compound can impact the atmospheric oxidative capacity, and the abundances of tropospheric ozone and organic aerosol at the regional and even the global scale, thereby influencing air quality. Understanding this impact and the dependence on anthropogenic emissions in a quantitative manner however, requires understanding the details of the underlying photochemistry of isoprene and its products over conditions relevant to the chemical environment of the atmosphere. Here, I will discuss recent progress on understanding the isoprene peroxy radical dynamics, isomerization pathways and rates of isoprene peroxy radicals, and the yield and fate of isoprene nitrates mechanism using a combination of laboratory, field, and modeling studies.

BioSketch: Dr. Crounse is a Staff Scientist in the Division of Geological and Planetary Sciences at Caltech. Dr. Crounse received his doctoral degree in Chemistry from Caltech in 2011. He received his BS in Chemistry and Mathematics from Andrews University. His current research interests are focused on understanding the photo-oxidation mechanisms of important organic species in the atmosphere, and how these processes impact atmospheric pollution and climate. He enjoys developing new instrumentation and technologies in support of this work.

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