

## BROADBAND MICROWAVE STUDY OF REACTION INTERMEDIATES AND PRODUCTS THROUGH THE PYROLYSIS OF OXYGENATED BIOFUELS

CHAMARA ABEYSEKERA, ALICIA O. HERNANDEZ-CASTILLO, SEAN FRITZ, TIMOTHY S. ZWIER, *Department of Chemistry, Purdue University, West Lafayette, IN, USA.*

The rapidly growing list of potential plant-derived biofuels creates a challenge for the scientific community to provide a molecular-scale understanding of their combustion. Development of accurate combustion models rests on a foundation of experimental data on the kinetics and product branching ratios of their individual reaction steps. Therefore, new spectroscopic tools are necessary to selectively detect and characterize fuel components and reactive intermediates generated by pyrolysis and combustion. Substituted furans, including furanic ethers, are considered second-generation biofuel candidates. Following the work of the Ellison group, an 8-18 GHz microwave study was carried out on the unimolecular and bimolecular decomposition of the smallest furanic ether, 2-methoxy furan, and its pyrolysis intermediate, the 2-furanyloxy radical, formed in a high-temperature pyrolysis source coupled to a supersonic expansion. Details of the experimental setup and analysis of the spectrum of the radical will be discussed.