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## Photooxidation of Acetone and Butanone on Rutile $TiO_2$ (110)[1]

DANIEL P. WILSON, DAVID SPORLEDER, Stony Brook University, MICHAEL G. WHITE, Stony Brook University, Brookhaven National Laboratory, WHITE GROUP TEAM — Interest in the photooxidation of organic compounds on heterogeneous surfaces such as $TiO_2$ has increased in recent years. Here, acetone and butanone, two common organic ketones, are studied under UHV conditions to determine what fragmentation occurs during photooxidation and to gain insight as to the predictability of desorbing species. The data was collected using a pump-probe time-of-flight (TOF) method. Excitation occurs via exposure to 3.7 eV photons followed by ionization with 13.05 eV photons. Preheating the surface to ~200K facilitated the formation of an organic-diolate species needed for photoactivity. During butanone photooxidation, different desorption mechanisms between mass 30 and masses 27-29 are evident. Background thermal results and preliminary translational energy distributions are calculated for acetone and some butanone fragments and are presented here.

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Daniel P. Wilson
Stony Brook University

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