

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Photoinduced Desorption of O<sub>2</sub> and Photooxidation of Organics from TiO<sub>2</sub>(110) Surfaces** DAVID SPORLEDER, DANIEL WILSON, Stony Brook University, MICHAEL WHITE, Brookhaven National Lab and Stony Brook University — We present here, a study of photoinduced O<sub>2</sub> desorption from, and reaction with coadsorbates on, a single crystal rutile TiO<sub>2</sub>(110) surface. Translational energy distributions of O<sub>2</sub> photodesorbed with a photon excitation energy between 3.5 and 4.2 eV were measured using a pump-probe, time-of-flight (TOF) method. This method utilized a one-photon VUV ionization scheme for product detection that was developed in our lab. The translational energy distribution was found to be trimodal, indicating that different O<sub>2</sub> species (i.e. O<sub>2</sub><sup>-</sup> or O<sub>2</sub><sup>2-</sup>) or binding sites may play a role. It was found that the O<sub>2</sub> translational energy distributions did not depend on the excitation energy over the range studied, which is consistent with a substrate mediated excitation mechanism involving hole capture. More recent experiments are exploring the mechanism for photooxidation of organic molecules. Specifically, we are determining translational energy distributions of small radicals originating from photoinduced fragmentation of simple ketones on a TiO<sub>2</sub>(110) surface.

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Date submitted: 16 Nov 2007

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