

Abstract Submitted
for the TSF15 Meeting of
The American Physical Society

Plasmon-Induced O₂ Dissociation on Ag(111) BLAKE BIRMINGHAM, ZACHARY LIEGE, Baylor University, DMITRI VORONINE, Texas AM University, Princeton University, KENNETH PARK, ZHENRONG ZHANG, Baylor University, MARLAN SCULLY, Baylor University, Texas AM University, Princeton University — Dissociation of O₂ molecules is the rate limiting process in many catalytic reactions on metal catalysts. Ordinarily the O₂ dissociation process requires a large input of thermal energy and is therefore conducted at high temperatures. We have studied this reaction by exploitation of localized plasmon resonances at conducting nanoparticles at relatively low temperatures. Nanostructures were prepared on Ag(111) by roughening the surface via Ar⁺ sputtering. Localized plasmonic resonances were excited with an incident 532nm laser. Excitation of the O₂ by the enhanced electric fields near nanostructures can lead to dissociation of the molecule into its constituent components. This dissociation is evidenced by adsorbate oxygen atoms on surface of Ag(111) in proximity to nanostructures, observable by Scanning Tunneling Microscope.

Blake Birmingham
Baylor University

Date submitted: 09 Oct 2015

Electronic form version 1.4