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Photocatalytic properties of nanostructured TiO2 surfaces[1] LAUREN MOORE, Northeastern University, TIMOTHY LUTTRELL, MATTHIAS BATZILL, University of South Florida — Photocatalytic chemical reactions are actively explored for direct production of chemical fuels from sun light through electrolysis or for the clean-up of organic pollutants through photocatalysis. Titanium dioxide is a prototypical photocatalyst which has been studied extensively. However, there are still unanswered questions regarding the relationship between surface morphology and photocatalytic properties. In this study, we used ion beam assisted surface nanopatterning and UV-catalysis to investigate the dependence of photoreactivity on surface nanostructures. Energetic argon gas ions were used to induce self-formation of nanopatterns on TiO2 surfaces and the structure formation was characterized by atomic force microscopy. The influence of the surface structure on the photochemical properties was assessed through photocatalytic degradation of methyl orange in aqueous solution with a flat sample and a nanopatterned sample of TiO2, respectively. The resulting absorbance spectrums were then compared.

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