

Abstract Submitted
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Probing Transient Structures during interfacial charge transfer mimicking solar cells and heterogeneous catalysis¹ LIN CHEN, Argonne National Lab./Northwestern U., XIAOYI ZHANG, Argonne National Lab., GRIGORY SMOLENTSEV, Southern Federal University, JIANCHANG GUO², KLAUS ATTENKOFER, ANDREW B. STICKRATH, DI-JIA LIU, Argonne National Lab, NOSHEEN GOTHARD, Northwestern University — Photoinduced charge transfer at interfaces is a key process in photocatalysis and dye sensitized solar cells (DSSCs). Using X-ray transient absorption (XTA) spectroscopy, we extracted metal center surrounding transient structural information in a DSSC mimic, namely the RuN3 dye on the TiO₂ nanoparticle surfaces. Structural evolution of the adsorbed dye sensitizer and the rearrangement of the nanocrystal surface associated with the electron density shift during and after the interfacial charge injection were investigated. The other interfacial charge transfer system is a suspension of Pt nanoparticles on TiO₂ where the photoexcitation induces redox reactions and generate hydrogen fuel. The preliminary XTA results demonstrate the feasibility of the method in probing heterogeneous catalytic systems.

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