第372回触媒化学研究センターコロキウム

共催　電気化学会,日本化学会

Designer Interfaces for Energy Storage and Recovery

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2015年7月27日（月）13:30—15:00

（創成科学研究棟4階セミナー室B・C）

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The widespread utilization of renewable energy will require energy dense and cost-effective methods for storage. This challenge could be met by coupling renewable electricity to the reduction of carbon dioxide and/or protons to fuels and the oxidation of water to O_2, providing, in net, a viable scheme for artificial photosynthesis. Likewise, the resulting fuels could be recombined in a fuel cell to comprise a net carbon-neutral cycle for energy storage and recovery. Realizing these goals requires the development of new electrocatalysts with enhanced selectivity, efficiency, and durability. We adopt a bottom-up approach to the design and discovery of new electrocatalysts that emphasizes controlling surface structure with atomic and molecular precision. The approach has led to the discovery of a new earth-abundant catalyst for oxygen reduction to water and the elucidation of key design principles for the efficient reduction of CO_2 to fuels. Our latest findings in both of these areas will be discussed.

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Yogesh (Yogi) Surendranath received dual degrees in chemistry and physics from the University of Virginia, where his research focused on the organometallic chemistry of low valent tungsten coordination complexes. He then pursued graduate work in Inorganic Chemistry at MIT under the direction of Prof. Daniel Nocera, where he investigated the mechanism of oxygen evolution mediated by oxidic Co-based thin film electrocatalysts. After receiving his Ph.D., Prof. Surendranath undertook postdoctoral studies as a Miller Research Fellow at UC Berkeley, under the direction of Prof. Paul Alivisatos. His postdoctoral work investigated how molecules can be used to controllably dope nanocrystal thin films for next generation optoelectronic devices. In the summer of 2013, he assumed his current position as Assistant Professor of Chemistry at MIT. His research group aims to use electricity to rearrange chemical bonds by controlling interfacial reactivity at the molecular level. Prof. Surendranath has authored over 30 publications and is the recipient of numerous awards including an NSF CAREER award, a DOE Young Investigator Award, an Air Force Young Investigator Award, and a Toyota Young Investigator Award from The Electrochemical Society.

372nd Catalysis Research Center (CRC) Colloquium

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