

LAC L. M. Venanzi Distinguished Lecture 2016

Prof. Dr. T. Don Tilley
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1. Vortrag:

Dienstag, 12. April 2016, 17.15 Uhr, ETH, HCI J7

«The Role of High Oxidation State Metal Species in Water Oxidation and Solar Fuels Production»

The integration of photovoltaics and catalysts into a useful system for solar energy conversion will require a number of advances, such as the development of high efficiency, nanoscaled photovoltaic units, the discovery of inexpensive electrocatalysts for the half-reactions of interest, and the incorporation of efficient catalysts onto the surfaces of the photovoltaics. For schemes based on water oxidation, it is possible to envision catalysts derived from molecular transition metal complexes, or from inorganic solid-state materials. Molecular catalysts for water oxidation are somewhat controversial, since ligands in the catalytic species may readily undergo degradation under highly oxidizing conditions. Also, it is difficult to confidently associate catalytic activity with a particular molecular species, since these may oxidatively decompose to catalytic metal oxide materials under the conditions of electro- or photo-catalysis. However, molecularly derived catalysts offer a number of potential advantages, including the synthetic tunability of structure-activity relationships and chemical properties. Also, molecular precursor methods may be used to produce nanostructured, robust heterogeneous catalysts of controlled structure. The study of model, high-valent molecular species can provide key insights into the mechanism of water oxidation, and thereby help bridge the gap between heterogeneous and homogeneous systems to allow for more rational design of catalysts. This presentation will describe high-valent metal complexes and clusters, and a detailed mechanism for the evolution of oxygen *via* water oxidation at a tetra-cobalt cubane complex.

followed by a get-together in front of J7

Guests are most welcome



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