

次世代ナノサイエンステクノロジー研究会  
理研セミナーのお知らせ

# “Identification of Surface Intermediates: Reconciling Single-Molecule Observations by STM with IR Spectra of Monolayers”

Professor Michael Trenary  
Department of Chemistry,  
University of Illinois at Chicago

日時：2010年6月10日(木) 午後16-17時

場所：ナノサイエンス実験棟 2階 セミナー室

A major goal of research in heterogeneous catalysis is to determine the mechanism by which chemical reactions take place on transition metal surfaces. In pursuit of this goal, spectroscopic studies are often used to identify stable molecular species that form in the course of surface chemical reactions. The technique of reflection absorption infrared spectroscopy (RAIRS) has the sensitivity and resolution to measure the vibrational spectrum of a large variety of molecular species present on surfaces at submonolayer coverages, including novel stable intermediates that are structurally distinct from species that are stable in the gas phase. As each molecule has a unique vibrational spectrum, RAIRS can be used to identify particular chemical species with high confidence. On the other hand, the technique is not quantitative and does not readily yield the relative coverages of various species that might coexist on a surface. In contrast, with low temperature scanning tunneling microscopy individual atoms and molecules can be observed and their absolute coverages readily determined simply by counting. The LT-STM does not, however, readily yield the chemical identity of the species observed. By combing RAIRS data obtained at the University of Illinois at Chicago with LT-STM images obtained at the Institute of Chemical and Physical Research at Wakoshi, Japan, of the same surface chemical systems, a great deal of new and unique information on surface intermediates can be obtained. This will be illustrated with several adsorbates and their reactions on the Pt(111) surface.

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RIKEN Seminar

# "Identification of Surface Intermediates: Reconciling Single-Molecule Observations by STM with IR Spectra of Monolayers"

Professor Michael Trenary

Department of Chemistry,  
University of Illinois at Chicago

Time & Date : Thursday, June 10<sup>th</sup>, 2010, PM 4:00-5:00

Place : Seminar room, 2<sup>nd</sup> floor, The Nanoscience Joint Laboratory

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