Department of Chemical Engineering Seminar Series

A Theory of Transition Metal Heterogeneous Catalysis

Jens K. Norskov
Professor, Chemical Engineering
Sanford University

Monday, November 16, 2015
Lecture: 4:00-5:00 p.m.
Physics Astronomy Building (PAA) A110
Reception at 3:30 p.m. PAA A110

Abstract

The lecture will outline a theory of heterogeneous catalysis that allows a detailed understanding of elementary chemical processes at transition metal surfaces and singles out the most important parameters determining catalytic activity and selectivity. It will be shown how scaling relations allow the identification of descriptors of catalytic activity and how they can be used to construct activity and selectivity maps. The maps can be used to define catalyst design rules and examples of their use will be given.

Speaker Biography

Jens Nørskov is a professor of Chemical Engineering and Photon Science and Director of the SUNCAT Center for Interface Science and Catalysis at Stanford University and SLAC National Accelerator Laboratory. Jens Nørskov received his PhD in theoretical physics at the University of Aarhus, Denmark in 1979. Following his PhD he was a research fellow, post-doctoral researcher and staff scientist at several institutions including the Nordic Institute for Theoretical Physics, IBM T.J. Watson Research Center and Haldor Topsøe. In 1987 he joined the Technical University of Denmark as professor of physics. In 2010 he moved to Stanford University and SLAC National Accelerator Laboratory.

Jens Nørskov's research aims at developing theoretical methods and concepts to understand and predict properties of materials. He is particularly interested in surface chemical properties, heterogeneous catalysis, (photo-) electro-catalysis, and applications in energy conversion. Jens Nørskov has received a number of awards and honors, most recently the Rigmor og Carl Holst-Knudsen Award from Aarhus University, Irving Langmuir Award from the American Physical Society and the Michel Boudart Award from the American and European Catalysis Societies. He holds honorary doctorates at the Technical University of Eindhoven and at the Norwegian University of Science and Technology, and is a member of the Royal Danish Academy of Science and Letters, the Danish Academy of Engineering, and the US National Academy of Engineering.