

MS&E Department Seminar

“Interfacing electrochemistry”

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Time: 4:00 PM, Room 1315 Chemistry; 1101 University Avenue

Host: Prof. Song Jin, Chemistry Department

ABSTRACT:

Electrocatalysis lies at the heart of the chemical phenomena that take place at electrochemical interfaces. In the future it will be the key to driving technological innovations that are urgently needed to deliver reliable, affordable and environmentally friendly energy. The electrochemical interface is a place where changes from the bulk properties manifest themselves in a variety of ways: i) differences in atomic arrangements close to or at the electrode surface, e.g. surface relaxation or reconstruction, ii) differences in electrode composition close to the surface, e.g. segregation profile in alloys, iii) adsorption of species from electrolyte onto the electrode surface – the so called spectator species, iv) ordering of solvent and/or electrolyte molecules observed in the proximity of the surface, v) changes in electrolyte composition within up to 10 nm from the electrode. As such, the electrochemical interface is extremely hard to control. However, to control the interface means to control the electrochemical reaction.

In this lecture, we present a surface science approach for the design of stable, active and low-cost materials for wide range of electrocatalytic processes, spanning from hydrogen production and hydrogen utilization to oxygen evolution and oxygen consumption in alkaline and acid environments.

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