Materials Science and Engineering Department

Fall Seminar Series

Manganese Oxide as an Electrocatalyst for Energy Related Chemistry

Prof. Daniel Strongin
Department of Chemistry
Temple University

October 23, 2024
11AM-12PM | Hill Seminar Room (LeBow 240)

The Strongin group is interested in understanding the fundamental properties of metal oxides and sulfides that can be exploited for energy related electrocatalysis. Research in the group has largely keyed in on water splitting and on the optimization of catalysts for the two associated half reactions: the oxygen evolution reaction (OER) and hydrogen evolution reaction (HER). Efficient water splitting using electrical energy produced by solar would allow a move toward a hydrogen economy. Both theory and computation from laboratories across the globe have guided the design of catalysts for both reactions. The goal continues to be the development of catalysts that can be used to drive the OER and HER with the lowest possible energy (i.e., voltage), while maintaining a high structural stability. The seminar will highlight research that shows how the integration of theory, computation, and experiment have led to new scientific insight to aid the design of water splitting catalysts, which include 2D layered metal oxides and layered double hydroxides. For the presentation, a special emphasis will be placed on the electrocatalytic properties of manganese oxide phases with and without transition metal substituents that include Ni, Co, and Ir.

Daniel Strongin is a Professor of Chemistry and Associate Dean of Graduate and Postdoctoral Affairs in the College of Science and Technology at Temple University. He received his A.B. from Washington University in St. Louis in 1984 and Ph.D. from the University of California- Berkeley in 1988. From 1988 to 1989 he was a visiting scientist at the IBM-Almaden Research Center. His research effort has included investigating the oxidation of sulfide minerals, the sequestration of toxic metals by carbonate minerals, and currently includes the use of nanomaterials for environmental remediation and electrocatalysis for sustainable energy that include water splitting for hydrogen generation and for the conversion of carbon dioxide to commodity chemicals.

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