“Ion Transport Behavior in Nanoporous Inorganic Membranes and Application in Redox Flow Batteries”

Ioannis Michos,
PhD Student,
Chemical Engineering,
University of Cincinnati

Date: April 17, 2015
Time: 12:20 - 1:15 pm
Venue: Baldwin 749

ABSTRACT:
A Redox Flow Battery (RFB) is a type of rechargeable battery that stores energy in soluble redox couples by oxidation and reductions. A typical RFB consists of two electrolyte flow compartments which contain the redox couples. The compartments are separated by an Ion Exchange Membrane (IEM) which selectively allows the transport of non-reaction ions (such as $H^+$) but blocks the transport of multivalent metal ions. The study of the transport mechanism of the ions leads in developing more efficient membranes to solve major problems that currently hurt RFBs such as ion crossover, limited ion selectivity and long term chemical stability. Our goal is to fabricate inorganic membranes with different pore size, experimentally study the diffusion coefficient of various ions and understand the relation between the diffusion coefficient and the RFB performance for improved efficiencies.

Bio:
Mr. Ioannis Michos received his Diploma Degree in Chemical Engineering from University of Patras in Greece and he is now attending the PhD program in Chemical Engineering at University of Cincinnati under the direction of Dr. Junhang Dong. His research focuses in fabrication of ion exchange membranes and investigation of ion transport mechanisms in nanoporous inorganic membranes. Currently he is focusing in studying the transport mechanisms in nanoporous inorganic membranes of various ions that are involved in Redox Flow Batteries (RFB) and the performance of those membranes under RFB operation.