5th Annual AIChE Midwest Regional Conference

January 31st – February 1st, 2013
Organized by the Chicago Local Section of the AIChE
Hosted by the Illinois Institute of Technology, Chicago, IL

Session Th3A: 3:00pm -4:30pm, Thursday January 31, 2013 (Armour Dining)
Fluidization and Fluid-Particle Systems
Session Organizer: Hamid Arastoopour, Illinois Institute of Technology
Session Co-Chairs: Hamid Arastoopour, Illinois Institute of Technology and Ray Coco, PSRI

3:00pm **Fluidized Bed Design and Pitfalls**
Ray Coco, PSRI
In the past 2 years, a new source of crude oil has hit the U.S. market. These oils, commonly called Shale Oils, are a class of light crudes produced from various "shale plays" in North America. At first glance, these crudes are light, low viscosity, low in sulfur and asphaltenes, and appear to present a high quality crude for refining. Upon closer examination, severe processing issues are likely, and in fact are being reported on a frequent basis. Processing and managing the Shale Oil requires the following: first, anticipating potential problems; and, second, providing a surveillance plan to give early warning/detection of problems should they arise. This presentation will discuss the challenges encountered, the impacts on refining profits and suggested steps to take in advance to fully prepare the refinery for Shale Oils.

3:30pm **Introduction to Cyclones**
Bill Heumann, Heumann Environmental Company, LLC
How cyclones work / Different styles of cyclones / Why use a cyclone/ When not to use a cyclone / Basic metrics of cyclone performance / Cyclone Total Collection Efficiency / Tools for achieving increased cyclone efficiency / Costs of achieving increased cyclone efficiency / How cyclones fail

4:00 **CFD Simulation of CO_2 Sorption in a Circulating Fluidized Bed**
Emadoddin Abbasi, Javad Abbasian and Hamid Arastoopour, Illinois Institute of Technology
Computational Fluid Dynamics (CFD) approach was used to simulate sorption of CO2 using solid sorbents in the riser section of a circulating fluidized bed. The simulation results were compared with the experimental data of KIER for continuous CO2 sorption using Potassium Carbonate in a circulating fluidized bed system.