

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 Th2C: 1:00pm -2:30pm, Thursday January 31, 2013 (Trustee Room)

Refinery Processing of Shale Oils and Tight Oils

Session Organizer: Gerald Wilks, Citgo

Session Chair: Gerald Wilks, Citgo

1:00pm Predict®-Crude: Quantifying Naphthenic Acid Corrosion in Refineries

Kwei-Meng Yap and Sridhar Srinivasan, Honeywell Processing Solutions, Houston, TX

The advent of opportunity crudes and the commercial necessity of processing crudes with widely varying speciation characteristics have highlighted the inadequacies of industry rules of thumb and guidelines such as API RP581 Base Resource Document for crude corrosivity assessment. These guidelines, which focus on TAN, wt% sulfur, temperature and alloy content tend to lead to overt conservatism in alloy selection, and on other occasions, may lead to material choices that suffer significant naphthenic acid / sulfidation corrosion. This talk describes a novel corrosion prediction system called Predict-Crude to quantify potential corrosion damage due to naphthenic acid and sulfidation corrosion in side cut piping. The system captures key parametric relationships gleaned from a recently concluded Joint Industry Project correlating naphthenic acid content, active sulfur content, temperature, wall shear stress and other relevant parameters to corrosion quantification and material selection.

1:30pm Managing the Challenges that Arise When Processing Shale Oils

George Duggan, Baker Hughes

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.

2:00pm Water Issues Related to Refining of Canadian Heavy Crude Oil

Ian Scarth, ChemTreat Inc.

What used to be classified as opportunity crudes, Canadian heavy, is now the main course in the diet for many refineries in North America. Running these crudes high in viscosity, solids, asphaltenes, TAN and sulfur, often requires additional equipment and significant operational changes to realize their economic benefit. This presents unique challenges to the water systems in these refineries. This paper will discuss these challenges and the mechanical and chemical approaches required to meet them.