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**POSTER**

**FOULING CHARACTERISTICS AND MITIGATION OF SOUR CRUDES**

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Fouling in refineries during petroleum processing occur when fuels are subjected to temperatures typically around 300°C. Although the amount of fouant is small in a short period, but because of high throughput and the length of time on stream, a significant amount of deposits is formed. The flow restriction reduces throughput and solids formation reduces process efficiency resulting in higher energy cost and overall green house gases (GHG) emissions. Although the mechanism of fouling is complex but the occurrence of fouling in different parts of petroleum processing has some commonality. Deposits are usually formed by; asphaltenes precipitation, polymerization of reactive components of the oil and also by impurities such as corrosion products.

Most common causes of fouling have been identified as, inorganic solids, oil incompatibility on mixing, coke from over thermal treating, polymerization of olefins and di-olefins, and insoluble asphaltenes on cooling after conversion. Once the cause of fouling is identified the mitigation can be develop to reduce or eliminate solids formation. Different chemistries have been developed to reduce process fouling by using anti-foulants. Different laboratory methods and techniques have been developed for measuring fouling rates of petroleum streams.

Research on fouling of different crudes has shown that paraffinic crudes with low asphaltenes had relatively high fouling rates. More recently work at NCUT showed that a high fouling crude can be stabilized and its fouling rates was reduced by addition of bitumen containing relatively high concentration of resins. The fouling rates were shown to be additive and correlated with the percent of bitumen in the mixture of crude plus bitumen.

Results will be presented showing the coking propensity/onset of a highly foulant crude as function of process severity. Further, it will be shown how fouling can be reduced by the addition of bitumen containing high concentration of aromatics and resins.