## Question 57: What is your best practice and expected efficiency in removal of calcium napthanates in higher calcium crudes? Has anyone experienced severe fouling in downstream unit equipment (i.e., Vacuum Heater, Coker heater) when processing high calcium crudes? What are the concerns when processing resid containing high Calcium content?

**George Duggan** (Baker Hughes)

We have extensive experience removing calcium and other metals from crude oils, with over 20 successful applications removing contaminants spanning the last 8 years. These experiences allow us to tailor programs for customers not only in terms of contaminant removal, but also with regard to downstream corrosion, environmental and product quality concerns. As already mentioned, carboxylic acids are often used for contaminant removal, although mineral acids such as sulfuric acid have also been applied. Since many of the acids will provide some degree of negative side effects, the choice of acid becomes most critical. For example, acetic acid has been shown to have severe impacts on emulsion band growth and waste water plant upsets. Acetic acid also has a severe, negative impact on overhead corrosion, due to its greater tendency to partition to the crude oil in the desalter. Citric and oxalic acids are particularly bad options due to low solubility of calcium salts, which causes major desalter fouling issues. Our patented EXCALIBUR contaminant removal technology utilizes acids that are selected to provide the optimum calcium removal while avoiding negative consequences. With EXCALIBUR, we have documented successful calcium removal while, at the same time, providing improved COD in wastewater plants, no concerns with desalter equipment fouling and minimal impacts on overhead corrosion. Preheat fouling can be a concern regardless of acid choice, due to evaporation of water in the desalted crude, which leaves salt deposits behind. Experience shows, however, that preheat fouling is rarely a major concern. In those few cases where fouling occurs, the salts can be easily removed with periodic off-line water washing. If offline washing is not an option, proven, low cost antifoulant treatments can be utilized to minimize fouling impacts.

(EXCALIBUR is a trademark of Baker Hughes Incorporated)

**Gary Gianzon** (Marathon Petroleum Company)

Marathon Petroleum Company LP (MPC) main concern when processing high calcium resid was calcium fouling the lower convection section and upper radiant section of the coker furnace which will make it difficult to online spall. As a precaution, we initially set calcium target at a very low concentration and have been monitoring and steadily raising the calcium limit as we gain experience in processing these types of crudes. The heater has been successful in online spall several times so our initial fouling concerns were not warranted.

Print as PDF:

Tags

Coker

Corrosion

Crudes

Desalting

Fouling

Process

Slurry

Sulphuric Alkylation

Year

2011