Question 53: Asphaltenes are known to destabilize at higher crude preheat temperature. Are there guidelines that can be used to determine the maximum allowable desalter operating temperature before the asphaltenes begin to drop out of solution and come out in the desalter brine?

George Duggan (Baker Hughes)

We have worked with several refining organizations that process heavy Canadian crude oils to find the optimum desalter operating temperature. In general, raising temperature reduces the crude oil viscosity, which is desirable from a Stokes' Law stand point as it makes breaking the emulsion easier. On the other hand, asphaltenes are destabilized by factors such as solvency, pH, and increasing temperature. In some crude blends, maximizing desalter temperature in an effort to improve oil-water separation has led to asphaltene destabilization, which contributes to emulsion band growth and negates the benefit of lower viscosity. The degree of asphaltene destabilization required to induce desalting problems is often less than that required to manifest itself as heat exchanger fouling. As mentioned on the previous question, our ASIT technology is used to gauge the relative potential for asphaltene instability in crude blending, both for desalting concerns and preheat fouling. Efforts to optimize desalter temperature have led to operating temperature targets to balance the needs for reducing viscosity with minimizing asphaltene instability effects. The customers who have gone this route consider the optimum temperature target confidential information, so we are not at liberty to share specific operating targets. For refiners who are unable to stay at or below the target temperature, we apply asphaltene stabilizer chemicals in the crude storage tanks to improve asphaltene stability and prevent desalter emulsion problems.

Tags

Blending

Crudes

Desalting

Fouling

Heat Exchangers

Optimization

Process

Tankage

Year

2011