

APPLICATION NOTE

Interface and In-Line Measurements in the HF and H₂SO₄ Alkylation Processes

Alkylation is an important refining process in which light olefins (e.g. propylene, butylene) are converted into higher value gasoline blending components with improved octane and vapor pressure properties. Agar technology can be applied in the alkylation process in two fundamental categories:

1. Interface detection and control in acid/alkylate separation processes (ID-200 Series Interface Detectors)
2. In-line measurement of acid/alkylate mixtures (OW-200 Series Oil/Water Monitors)

Regardless of the type of unit, one of the most important steps in the alkylation unit is the separation of the alkylate from the acid phase, typically accomplished in the settler. There are a variety of settler designs depending on the design of the unit, but the need for efficient interface control is critical in each. Product/acid cross contamination can cause overall efficiency problems, and can even result in hazardous operating conditions.

The capability to detect and prevent this cross contamination is the key to Agar's success at interface control, using the System 3 much as it is applied in the desalting process.

Unlike the crude desalting process where water content of the effluent crude can routinely contain 0.2-1.0% water, the hydrocarbon effluent (product) from the alkylation acid settler must be free of acid to a very low level. Here the ultra-low detection capabilities of Agar's OW-201 Microwave Oil/Water Monitor can be used to best effect. With the OW-201, trace levels of acid (as low as 500 ppm) can be measured, allowing for true process evaluation and optimization.

Other applications in the alkylation process include spent acid storage. Some systems store the spent acid prior to regeneration, and a layer of hydrocarbon can develop above the acid. It is critical that this hydrocarbon layer not be allowed to contaminate the feed to the regeneration process. The Agar ID-201 is utilized here to control the drainage of the spent acid tanks, alarming on the presence of hydrocarbon layer and preventing feed contamination.

