
Question 33: Are there any new technologies to control bromine index in aromatics streams? Do clay towers still provide the best operating value?

Michael Windham (UOP)

UOP has commercialized a selective hydrogenation for this application and Exxon Mobil offers an alternative catalyst that appears to be a direct replacement for clay. Our selective hydrogenation technology is meant to improve yield of aromatics as a result of avoiding the alkylation reaction which clay and other acid-based catalysts utilize. So far, we are encouraged but it is difficult to quantify the yield difference since so many species are involved. We do have one customer operating the selective hydrogenation that has asked to replace the existing C8+ clay treaters with the selective hydrogenation technology. We do not have solid data from their first unit to explain why they support this project, but it has been promised to us. The technology isn't free, so it has to be reviewed on a case-by-case basis and it is the yield of aromatics that determines the economics.

As some of our customers dig deeper into the aromatic stream to recover more rings into the BTX products the heavies produced by the clay acid catalyst are a nuisance as the temperatures at the bottom of the column recovering the heaviest cut of aromatics is higher. It's a minor effect but if you have an equipment limit you'd have to calculate the economics to see if it makes sense. We are aware of some operators using the Exxon-Mobil Olgone material but for obvious reasons we do not have information on that.

Brad Palmer (ConocoPhillips)

Clay treaters are the primary technology used to control bromine index in ConocoPhillips aromatic streams. Some units have installed a hydrocarbon recycle "drag" stream to route part of the Stripper overhead recycle stream further up the Extractor. This allows olefins and other light hydrocarbons to exit the Extractor overhead. Reformer severity and operation (water/chloride balance) can affect olefin concentration in the Aromatic Extraction Unit (AEU) feed through increased cracking. High severity units such as CCRs and Cyclic units produce more olefins than Semi-Regen units; over-chlorided catalyst increases olefin production.

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