
Question 75: The butane stream from a catalytic polymerization (cat poly) unit, which contains 69% isobutene, 14% butylenes, and 17% normal butane, would appear to be an excellent alkylation unit feedstock, especially if isobutene is i

METKA (Sunoco, Inc.) We operate a cat poly and sulfuric alkylation unit within the same refinery. The configuration offers flexibility and synergies that allow various operating and business demands to be met. In our configuration, the cat poly debutanizer overhead feeds the alkylation unit to recover the isobutane and any remaining butylenes.

Similar to our other SPA experience, acid carryover from the effluent filtration system typically drops to the bottom of the downstream fractionators resulting in fouling and corrosion of the reboilers. Historically, we have not experienced any significant impact on the alkylation unit or sulfuric acid quality due to carryover from the cat poly unit. If carryover were to occur, we do expect that the phosphoric acid would be more of a corrosion and fouling concern than an acid consumption issue.

Below is a plot that basically shows the way in which the plants are configured. The BB is treated and split to the cat poly and alky units in parallel. Once we recover the C4s off the backend of the cat poly plant, the stream is fed back into the alkylation unit.

Gasoline Processes
GasolineC4,C4=PolyTreaterAlkyContactorsDepropDebutDepropBtmsLPGPolymer
GasolinenC4,iC4ContactorEffluentDIBDebutnC4/AlkylatenC4AlkylateMake-up
C4iC4PolyAlkyFCCGasolineMixed ButaneC4nC4Rxr EffluentTreated C4, C4=EffluentTreatingPolyRxrs
(FUNKY GRAPHIC)

ZMICH (UOP LLC) I have three points that I would like to make.

- 1) UOP does not have experience with traces of phosphorus in the alkylation unit feed.
- 2) UOP strongly recommends avoiding the possibility of phosphorus in the feed. The reason for this is that a combination of mineral acids will lead to a more aggressive corrosion than either of the two acids by themselves.
- 3) From a commercial perspective, UOP is aware of at least one refinery that feeds cat poly stream with feed from an FCC to an alkylation unit, and the process flow is shown in words as such: "Process flow is a stream goes through a water wash to remove phosphoric acid, the sand tower acting like a coalescer, and a UOP MeroxTM unit to remove sulfur before going to the alkylation unit."

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