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## Question 13: What are the typical causes for failing jet fuel thermal oxidation (JFTOT) and aviation turbine (AVTUR) specifications?

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The n-butane stream from an alkylation unit contains some organic fluorides. The fluoride must be removed in alumina treaters before being fed to an isomerization unit because the fluoride is a catalyst poison. When the fluoride is removed from the organic fluoride molecule, an olefin is formed. There should not be any olefins in the n-butane going into the alumina treaters, so the only olefins in the product are those created from the organic fluorides. So, the key to preventing excessive olefins in the n-butane product from the HF Alkylation unit is to prevent formation of an excessive number of organic fluorides in the n-butane going to the alumina treaters. This can be done by:

- Avoiding excessively low acid purity. Organic Fluoride production can increase significantly at acid purity below about 85% HF.
- Avoiding excessively low reactor temperature. Organic Fluoride production can increase significantly at acid purity below about 80 °F (27 °C).
- Avoiding excessively high concentration of iso-butane in the n-butane product. The iso-butane fraction from the main fractionator in the HF Alkylation unit typically has a higher concentration of organic fluorides than the n-butane fraction. (The organic fluorides in the iso-butane stream should be kept in the recycle isobutane stream to the reactor where the organic fluorides can be converted back to HF).

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Year

2014