Light Naphtha Isomerization Technology

Background

IndianOil R&D jointly with Engineers India Ltd. (EIL) licenses Light Naphtha Isomerization Technology for converting the linear C5, C6 paraffins (pentane and hexane) to corresponding branched isomers having higher octane number and also saturating almost all the benzene. The drop in octane due to benzene saturation gets compensated by the isomerization of paraffins.

Process Description

Light straight run naphtha and light reformate is passed through the DIP column for separating iso-pentane. The stream is then mixed with hydrogen rich gas and heated in furnace to desired reaction temperature before entering the fixed bed down flow reactor containing isomerization/benzenesaturation catalyst. The reactor effluent is then sent to the downstream separation section, where hydrogen rich gas is separated and recycled back to the reactor to maintain required hydrogen partial pressure. The low-octane normal/single branch C5, C6 paraffins are separated from high octane isomers in DIP & DIH columns and recycled back to the reactor for further isomerization. The isomerization product primarily contains high octane C5 & C6 paraffin isomers.
Salient Features

- Robust zeolite based catalyst – can tolerate sulphur and moisture naturally present in naphtha
- Moderate temperature operation
- RON gain > 15 units
- Isomerization & benzene saturation occurs in the single reactor with same catalyst
- Benzene in final isomerate is almost nil
- Negligible sulfur in the product isomerate
- Fresh feed with benzene as high as 5 wt% can be handled
- In-situ catalyst regeneration with long cycle time and long ultimate catalyst life
- Much simpler process scheme with single reactor instead of lead-lag reactor configuration
- Design and engineering expertise of EIL
- Ideal for retrofitting idle fixed bed units in refineries

Advantages

- Feed drying & desulfurization are not mandatory, reducing capital investment
- Ease of start up as elaborate drying is not required
- Injection of corrosive chloride agent is not required, eliminating the need for caustic scrubbing of effluent gases

Our Back up Strengths

- Pilot plant data bank and evaluation facilities
- Facilities for characterization of Feed, product and catalyst
- State-of-the-art process simulator
- Excellent technical support and troubleshooting expertise
- Process is under commercialization in one Indian refinery—commissioning by October 2011.

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