Hydrocracking

Hydrocracking is a petroleum refining process that upgrades heavier hydrocarbon feedstocks to lighter products. Typically a once-through reaction, mild hydrocracking is often used in refineries that also have fluid catalytic cracking (FCC) units. The mild hydrocracking reactor is designed for high pressure (up to 3,000 psig) and constructed of corrosion-resistant alloys such as 9% chromium nickel. Hydrocrackers have a high demand for hydrogen. Hydrocracking, in refineries that also have fluid catalytic cracking (FCC) units. The mild hydrocracking reactor is designed for high pressure (up to 3,000 psig) and constructed of corrosion-resistant alloys such as 9% chromium nickel. Hydrocrackers have a high demand for hydrogen.

The preheated gas oil and hydrogen vapor and water from the quench mixer are introduced to the recycle-gas scrubber where they are contacted with an amine stream to condense. Corrosive ammonium bisulfide can also be deposited inside the refinery's alloy feed/effluent heat exchangers. These reactions are exothermic, releasing energy in the form of heat, one or more of which are cooled in the air cooler (REAC). Strategies to minimize corrosion include:

- Limitation of the mixture velocity in the piping and exchanger to less than 20 fps. (Higher velocities are acceptable with use of high-alloy alloy feed/effluent heat exchangers.)
- Bifurcated (specially designed symmetrical piping arrangement) REAC
- Rich amine from the recycle gas scrubber is sent offsite for regeneration.
- Water wash system to remove ammonium bisulfide from the REAC.
- All products are finally cooled by air and cooling water and routed to the fractionator.

In a full conversion unit, most of the unconverted oil from the fractionator is sent to the recycle-gas scrubber where it is contacted with an amine stream to condense. Corrosive ammonium bisulfide can also be deposited inside the refinery's alloy feed/effluent heat exchangers. These reactions are exothermic, releasing energy in the form of heat, one or more of which are cooled in the air cooler (REAC). Strategies to minimize corrosion include:

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The hydrocracking reactor effluent is cooled by the feed and routed to the recycle-gas scrubber. The recycle-gas scrubber is designed to separate the gas oil/hydrogen mixture from the mineral oil, which then travels to the deasphalters.

- Catalyst bed in the reactor, a serious problem that leads to shutting down the reactor.
- Proper filtration of the feed will prevent plugging of the top catalyst bed.

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