

[HP]² FCC Technology

Catalyst & Process Technology for Light Olefins

Fluidized catalytic cracking (FCC) unit is the most important secondary processing unit in a refinery for cracking gas oil or residual feedstock. It is considered as the workhorse of a refinery. FCC units operate either on maximum gasoline mode or on the maximum distillate mode, which depends on seasonal product demand. The FCC unit could be operated in high severity mode to produce high yields of light olefins than conventional FCC operation. The olefins produced in FCC unit are the important source for petrochemicals. Catalyst and additives play vital roles in changing the product slate of the FCC unit.

HP Green R&D Centre (HPGRDC) has developed a novel catalyst formulation and process technology, [HP]² (Hindustan Petroleum High Propylene) FCC Technology comprising of catalyst and hardware system for maximizing propylene and minimizing CLO yields. Extensive lab studies were conducted for the development of the [HP]² FCC catalyst and process technology. Based on the bench scale-studies, cold flow pilot unit was set-up to establish the hydrodynamics of the hardware system and hot unit was commissioned. BEDP for setting-up of grass root [HP]² FCC unit is in progress. The proprietary tailor made smart catalyst system has multifunctional cracking potential.

This smart catalyst crack feed molecules by use of mesoporous and micro-porous functions and increase selectivity towards light olefins.

The catalyst system has application in high severity FCC units like HPCL patented [HP]² FCC Technology, DCC (Deep Catalytic Cracking) etc. In addition, this catalyst could be used as an additive in normal FCC units to maximize propylene and minimize bottoms. The field trial of this catalyst as an additive was carried at HPCL's Mumbai & Visakh refineries with inventory changeover of 10% & 15%. This has led to the product yield benefits in terms of delta increase of propylene by 0.5-0.6 wt% and reduction in bottoms by 0.2-1.0 wt%. Currently, demonstration of the catalyst system is in progress in one of the high severity FCC units.

HPGRDC can offer the catalyst both as an additive and as a high olefin catalyst to interested refineries, which can help in increasing their propylene yield and minimize bottoms depending upon the feed properties and operating conditions.