

SPECIAL CASES FOR PROVIDING THE HYDROCRACKING PROCESS FOR PETROLEUM FEEDSTOCK

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Petroleum hydrocracking is a versatile refining process used to convert heavy petroleum fractions into lighter, more valuable products like gasoline, diesel, and jet fuel. While hydrocracking is widely applied across the petroleum industry, there are specific special cases where this process is particularly advantageous or necessary:

Conversion of Heavy Residues: One significant special case of hydrocracking is the conversion of heavy residues, such as vacuum gas oil (VGO) and atmospheric residue (AR), into lighter products. These heavy fractions are typically challenging to process using conventional refining techniques due to their high viscosity and high boiling points. Hydrocracking breaks down these heavy molecules into lighter, more useful hydrocarbons under high pressure and temperature in the presence of hydrogen and a catalyst.

Production of High-Quality Diesel: Hydrocracking plays a critical role in producing ultra-low sulfur diesel (ULSD), which meets stringent environmental regulations for sulfur content in transportation fuels. By breaking down heavier hydrocarbons and removing sulfur, hydrocracking produces high-quality diesel with improved combustion properties and reduced emissions.

Hydrocracking of Shale Oil and Bitumen: With the increasing production of shale oil and bitumen from oil sands, hydrocracking has become essential for converting these unconventional feedstocks into valuable transportation fuels. Shale oil and bitumen typically contain high levels of heavy hydrocarbons, sulfur, and nitrogen, making hydrocracking an attractive option to upgrade these resources into lighter, cleaner products.

Maximizing Product Yields: Hydrocracking can be used strategically within a refinery to maximize the yield of high-value products like gasoline and diesel. By adjusting process conditions and catalyst formulations, refiners can tailor hydrocracking operations to optimize the production of specific products based on market demand.

In summary, petroleum hydrocracking is a versatile refining process that offers several advantages in converting heavy petroleum fractions into lighter, cleaner products. Its ability to remove impurities, produce high-quality fuels, and process diverse feedstocks makes hydrocracking a crucial technology in modern petroleum refining, especially in meeting stringent environmental regulations and adapting to evolving market dynamics.

References:

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