

Second-Stage PyGas Hydrogenation Catalyst

APPLICATION

The second-stage hydrogenation process of the C6-C8 fraction, also known as pyrolysis gasoline (PyGas), is a critical step in upgrading the C6-C8 fraction from steam cracker effluent. It aims to remove sulfur-impurities and improve its quality for further processing or use. This hydrotreatment process retains valuable aromatics such as benzene, toluene, and xylenes (BTX) for use as chemical feedstocks while fully saturating any remaining olefins to enhance stability, prevent spontaneous polymerization during storage or transportation, and improve the thermal stability of the PyGas fraction.

The feedstock for the second-stage hydrogenation is the partially treated PyGas from the first-stage hydrogenation, where diolefins and some sulfur-impurities have already been removed. After the second-stage hydrogenation, the PyGas is either sent to an aromatics plant for the separation of BTX components for chemical feedstock use or used as a high-octane component in gasoline.

DESCRIPTION

This catalyst uses composite alumina as the carrier and nickel, molybdenum, and cobalt as the active components, prepared using a proprietary processing technology. The catalyst exhibits good thermal stability, a low acid content on the surface, resulting in high selectivity, excellent anti-coking performance, operational stability, and a long service life. It is suitable for the hydrotreatment of C6-C8 fractions.

The reactive components are highly dispersed, providing excellent hydrogenation activity and a low starting temperature. The catalyst demonstrates high resistance to sulfur fluctuations and is well-adapted to both high-sulfur and low-sulfur feedstocks (< 50 ppm). The sulfur content in the product can be reduced to less than 0.2 µg/g, with an aromatics hydrogenation rate of less than 0.5% (m/m).

PHYSICAL & CHEMICAL PROPERTIES

Parameter	Unit	Specification
Form	-	cylinders
Color	-	blue-gray
Mean diameter	mm	1.25×7-12
Bulk Density	g/ml	0.70±0.05
Crushing Strength	N/cm	100
Al ₂ O ₃	%	>85
Active component		Mo-Co-Ni

PROCESS CONDITIONS & PERFORMANCE

Element	Unit	Specification
Pressure	MPa	>2.5
Temperature	°C	220-300
WHSV	kg _{feed} /kg _{catalyst} ×h	1.0-3.0
Catalyst lifetime	years	>6
Product sulfur content	ppm	<1
gBr/100g	ppm	<0.5