

Catalyst for C4/C5 Saturation Hydrogenation

APPLICATION

C4/C5 saturation hydrogenation recovery of butanes and pentanes is commercially proven process with many years of operating experience worldwide for total hydrogenation of C4s, C5s or C4/C5 mixture. In the process, C4s or C5s from an ethylene plant, refinery or MTO unit are hydrogenated to convert the contained olefins, alkynes, and dienes to primarily paraffins. The conversion of the olefins, acetylene and dienes is quite high with >99% saturation being readily achieved on the outlet of the saturation hydrogenation unit (SHU). The product from the SHU can be used as steam cracker feedstock or be sold as LPG.

DESCRIPTION

This catalyst utilizes alumina as the carrier and palladium as the active component, prepared through a specialized process. It offers excellent thermal stability, high hydrogenation activity, exceptional anti-coking performance, and a long service life. The catalyst is highly effective for the complete hydrogenation and saturation of unsaturated hydrocarbons in C4 fractions, ensuring reliable operational stability.

The C4/C5 Saturation Hydrogenation technology achieves near-complete saturation of diolefins and olefins using a single reactor. The reactor operates at moderate temperatures, minimizing fouling and maximizing regeneration intervals. Its uniform temperature distribution prevents hot spots, ensuring extended run lengths between regenerations. Typically, low-purity hydrogen from ethylene plants is sufficient for use, eliminating the need for a makeup compressor. The absence of a recycle gas compressor further reduces both capital and operating costs.

PHYSICAL & CHEMICAL PROPERTIES

Parameter	Unit	Specification
Form	-	bids
Color	-	brown
Mean diameter	mm	2.5-4.5 × 2.5-4.5
Bulk Density	g/ml	0.70±0.05
Crushing Strength	N/cm	60
Al ₂ O ₃		>99.5
Active component		Pd

PROCESS CONDITIONS & PERFORMANCE

Element	Unit	Specification
Pressure	MPa	2-4
Temperature	°C	60-90
WHSV	kg _{feed} /kg _{catalyst} ×h	0.5-2
Catalyst lifetime	years	>3
Olefins residual content	%	< 1%
Cycle length	year	>1