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Palladium Catalyst for First-Stage PyGas Hydrogenation

APPLICATION

The first-stage hydrogenation of PyGas is a critical step in the treatment of pyrolysis gasoline, a high-value by-product of steam crackers. This process focuses on selectively hydrogenating highly reactive dienes and alkynes while preserving valuable aromatic compounds and the majority of olefins. The feedstock is crude PyGas, which typically contains unsaturated hydrocarbons, aromatics, diolefins, olefins, gum, and sulfur impurities. Tailored design of Delion's catalyst and precise control of reaction conditions ensure minimal over-hydrogenation of aromatics, retaining their economic value.

Partially hydrogenated PyGas can also be used as a blending component for gasoline. Overall, the first-stage hydrogenation of PyGas is essential for ensuring its stability and quality, enabling efficient downstream processing.

DESCRIPTION

The catalyst is based on high-purity alumina as the carrier, palladium as the active component, and structural additives, processed using specialized preparation technology. Proprietary high-dispersion control technology for the active ingredient, palladium, is utilized during manufacturing. The catalyst exhibits high thermal stability, a long service life, and reliable operational stability. It is suitable for the selective hydrogenation and saturation of dienes in C6-C8 cracking gasoline fractions. The support's weak acidity provides excellent anti-coking performance and high selectivity. The highly dispersed reactive components ensure good low-temperature hydrogenation activity and enable rapid achievement of steady-state operation.

PHYSICAL & CHEMICAL PROPERTIES

Parameter	Unit	Specification
Form	-	cylinders
Color	-	brown
Mean diameter	mm	2.5×5-10
Bulk Density	g/ml	0.65±0.05
Crushing Strength	N/cm	100
Al_2O_3	%	>99
Active component		Pd

PROCESS CONDITIONS & PERFORMANCE

Element	Unit	Specification
Pressure	MPa	>2.5
Temperature	°C	40–90
WHSV	$kg_{feed}/kg_{catalyst}×h$	1.5–3.5
H2/oil volume	-	100~200:1
Catalyst lifetime	years	>3
Residual dienes	gI/100g	<2

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