

Catalyst for 2-Ethylanthraquinone Hydrogenation

APPLICATION

The hydrogenation of 2-ethylanthraquinone is a crucial step in the production of hydrogen peroxide via the anthraquinone process. This step involves the reduction of 2-ethylanthraquinone to 2-ethylanthrahydroquinone in the presence of hydrogen and a suitable catalyst. The reduced compound is subsequently oxidized to produce hydrogen peroxide. A highly selective hydrogenation catalyst, typically based on Pd, is used to ensure the selective hydrogenation of a solution of 2-ethylanthraquinone dissolved in an organic solvent, without over-reducing the aromatic ring. The hydrogenation is conducted in a reactor, usually a fixed-bed or slurry reactor.

DESCRIPTION

Delion offers a highly selective Pd-based catalyst for the fixed bed type of process. The catalyst was designed to ensure optimal hydrogenation efficiency of at least 8.5 g/L, selectivity of 95.0% or higher. The catalyst can produce hydrogen peroxide at a rate of 8.0 kg H₂O₂ (100%) per kilogram of catalyst per day, demonstrating its high activity and reliability in industrial operations. The process demonstrates excellent cost-effectiveness, with catalyst consumption guaranteed to remain below 0.04 kg per ton of H₂O₂ (27.5%), contributing to reduced operational expenses. The catalyst service life of at least 5 years. After five years of use, the catalyst retains 75% or more of its dry palladium content, reflecting its durability and potential for recovery and reuse. The catalyst's design enables regeneration cycles of 2 years or longer, further extending its operational life and reducing waste. These parameters underline the catalyst's advanced design and high performance, ensuring efficient hydrogen peroxide production, cost savings, and environmental sustainability.

PHYSICAL & CHEMICAL PROPERTIES

Parameter	Unit	Specification
Form	-	sphere
Color	-	gray-black
Mean diameter	mm	2.2
Bulk Density	g/ml	0.65±0.05
Crushing Strength	N/cm	>40
Al ₂ O ₃	%	>99
Active component		Pd

PROCESS CONDITIONS & PERFORMANCE

Element	Unit	Specification
Pressure	barg	0.5-3.0
Temperature	°C	50-90
Hydrogenation efficiency	gH ₂ O ₂ /L solution	≥ 8.5
Catalyst cycle	months	24
Catalyst life	years	>5
Production capacity	kg H ₂ O ₂ /kg cat × day	≥ 8.0
Hydrogenation selectivity	%	>95