Honeywell | UOP Catalysts

UOP I-500™ Catalyst System

For Xylene Isomerization and EB Dealkylation

Description

I-500 catalyst is UOP's latest EB dealkylation catalyst system. I-500 catalyst is used to re-establish an equilibrium distribution of xylene isomers in a stream of mixed xylenes that has been depleted of one or more isomers. Xylene isomerization catalysts are classified according to how they treat the ethylbenzene (EB) present in the mixed xylene feed. EB dealkylation catalysts convert EB to high purity benzene, while EB isomerization catalysts convert EB to additional xylenes.

Applications

I-500 catalyst is used in the UOP Isomar™ process for xylene isomerization. In most aromatics complexes, the Isomar unit works in tandem with a UOP Parex™ unit to produce high-purity *para*-xylene. Mixed xylenes are fed to the Parex unit, which preferentially extracts the *para*-xylene isomer. The Parex raffinate, which is almost entirely depleted of *para*-xylene, is then sent to the Isomar unit, which reestablishes an equilibrium distribution of *para*-, *meta*-, and *ortho*-xylene isomers. The product from the Isomar unit is then recycled back to the Parex unit for further extraction of *para*-xylene. In this way, the undesired xylene isomers are recycled to extinction. The Isomar process can also be used with the UOP MX Sorbex™ process to produce *meta*-xylene or, with suitable fractionation, to produce *ortho*-xylene.

I-500 catalyst is often used to debottleneck an existing aromatics complex. I-500 catalyst operates at high EB conversion which reduces the volume of the recycle stream around the Parex-Isomar loop. High EB conversion also reduces the concentration of EB in the feed to the Parex unit, which enhances separation efficiency. Replacing an EB isomerization catalyst such as UOP I-400™ catalyst with I-500 catalyst can substantially increase the effective *para*-xylene production capacity of an existing Parex unit.

Experience

I-500 catalyst was successfully commercialized in 2013 and is operating in eight xylene isomerization units.

Typical Physical Properties (nominal)

Shape	Extrudate
Nominal size, mm	1.5 x 4
Sock loaded ABD, kg/m^3 (lb/ft^3)	540 (33.7)

Packaging

- 55 U.S. gallon (210 liter) steel drums
- Net weight per drum of (105 kg)



UOP's I-500 catalyst system has improved pX/X selectivity and xylene retention with high benzene purity production.

FEATURES & BENEFITS

- High EB conversion per pass, no equilibrium limitation
- Higher pX/X, lower xylene loss and improved benzene selectivity compared to I-300 series catalysts
- Operates at high space velocity – less catalyst needed
- High purity benzene
- Excellent stability
- Regenerable using simple carbon burn procedure

For more information

www.uop.com

UOP LLC, A Honeywell Company
25 East Algonquin Road
Des Plaines, IL 60017-5017, U.S.A.
www.uop.com

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