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Product Data Sheet

PuriStar® R3-81 T5x3

Purification of Refinery Off-Gas Streams

PuriStar® R3-81 is a robust copper catalyst used in sulfided form for the removal of O_2, NO_x and traces of acetylene from refinery off-gas. PuriStar R3-81 is the focal point of a group of products used for the recovery of ethylene from refinery off-gases.

BASF PuriStar R3-81 comes in tablet form with a nominal diameter of 5 mm and height of 3 mm (approx. 3/16" x 1/8").

Product Application

Refinery off-gas (ROG) refers to a gas mixture consisting mostly of hydrogen, methane, ethylene, ethane and a number of different impurities. This type of gas is e.g. generated in catalytic cracking units (FCC, DCC, CPP) and can be of interest for recovery of H_2 and C_2H_4.

R3-81 is used in sulfided form. The sulfiding is typically done in situ (in the reactor itself). For smaller amounts, an ex-situ sulfiding at a recommended toller is also possible.

A detailed sulfiding procedure specific for R3-81 is provided with the purchased material.

R3-81 removes O_2, NO_x and traces of acetylene by selective hydrogenation while showing the lowest olefin loss of any currently available ROG oxygen removal catalyst.

R3-81 is used in gases with high contents of CO and eliminates the formation of carbonyls (like Ni carbonyls).

The operating temperature of R3-81 is 180 to 275°C (360 to 530°F) depending on the off-gas composition.

The composition and its properties makes R3-81 suitable for numerous regenerations and tolerant to poisons like AsH_3, chlorine or mercury.

BASF's alternative for gases low in CO is PuriStar R8-21. Please refer to the respective data sheet for more information.

Packaging (Typical)

- 800 kg net (1763.7 lbs) in 1150 l super sacks (IBC flexible)
- 100 kg net (220.5 lbs) in 120 l steel drums

Shipping Point

- Ludwigshafen, Germany

Typical Properties	
Chemical	
Main Components	CuO
Balance	Silicate with promoters
Physical	
Crush Strength	Approx. 5 kg (11 lbs), side wall
Bulk Density	~ 900 kg/m³ (56 lbs/ft³), tapped ~ 830 kg/m³ (52 lbs/ft³), sock loaded

About Us

BASF's Catalysts division is the world's leading supplier of environmental and process catalysts. The group offers exceptional expertise in the development of technologies that protect the air we breathe, produce the fuels that power our world and ensure efficient production of a wide variety of chemicals, plastics and other products, including advanced battery materials. By leveraging our industry-leading R&D platforms, passion for innovation and deep knowledge of precious and base metals, BASF's Catalysts division develops unique, proprietary solutions that drive customer success.

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