AdESulfur™- 200

Catalytic Sorbent for Deep Desulfurization of Diesel, Gasoline and Natural Gas

WWW.ADVANCEDENERGYMAT.COM

ADEM Technologies Inc. (ADEM) has developed a new catalytic sorbent "**AdESulfur™-200**", for ultra-deep desulfurization of fuels such as diesel, jet fuel and natural gas. AdESulfur™-200 utilizes catalytic compositions that can keep active metals in zero-valent state and nanowire-based materials for high activity towards ultra-deep desulfurization. ADEM introduces its new generation of sorbent "AdESulfur™" that contains atomically dispersed active metallic sites for high capacity and regenerable, catalytic sorbent for sulfur sorbent. AdESulfur™ specifically removes 'S' containing chemicals and retains 'S' with in the sorbent without releasing any H_2S.

311 E Lee St, Louisville, KY 40208 Phone: (502) 499-0095 Email: adem.louisville@gmail.com

ADEM ADVANCED ENERGY MATERIALS

AdESulfur™- 200

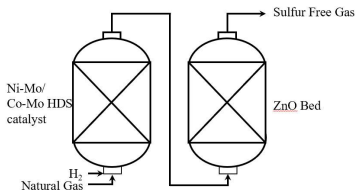
Catalytic Sorbent for Deep Desulfurization of Diesel, Gasoline and Natural Gas

PHYSICAL CHARACTERISTICS

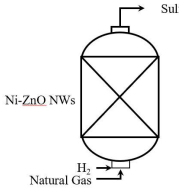
AdESulfur™- 200 is a fast-reacting catalytic sorbent that effectively removes sulfides, disulfids, mercaptans, thiophenes, carbonyl sulfide (COS), tetrahydrothiophene (THT), hydrogen sulfide (H_2S), benzo-thiophenes and di-benzo-thiophenes in both vapor and liquid phase desulfurization.

Natural gas & Biogas: One product solution that replaces three towers with just two towers in lead-lag fashion. Able to handle all types of sulfur species bringing sulfur levels to <1 ppb with breakthrough capacity ~22%by wt. and saturation capacity ~34% by wt. has sulfur chemisorb capacity ~3% by wt. without hydrogen.

Physical Specifications	
Shapes	4.2 mm, 2 mm, Trilobe extrudates
Crush Strength	1.5 - 2.0 lb/mm
Packing Density	88 - 94 lb/ft^3



Two-step Conventional Hydrodesulfurization



ADEM Solution

LIQUID HYDROCARBON APPLICATIONS

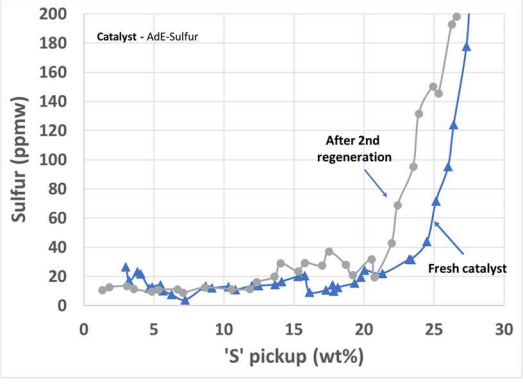
Application	Typical Conditions	Advantages
Ultra-Low Sulfur Diesel (ULSD)	H_2-100-200 SCF/BBL; 250-325 C, 20 bar	No H_2S, Low H_2, milder P & T, deep desulfurization, reduces severity on primary HDS.
Ultra-Low Sulfur Gasoline (ULSG)	375-500F, 20-50 SCF/BBL, 5-15 bar	Less than 0.5 octane loss - sulfur from 270 ppm to <15 ppm
Alky Feed	1-5 bar, <2%vol H_2, 350-450F	Vapor phase desulfurization at atmospheric pressure <1 ppm, no olefinic saturation
Kerosene & Other Liquid Hydrocarbons	15-20 bar, 450-550F, H_2-200 SCF/BBL	Reduces to <15 ppm from 750 ppm. No H_2S, Low H2 requirement, milder P & T
Lube Oil Derived Diesel	<1 vol% H_2, 400-550F, atmospheric	Vapor phase desulfurization down to <15 ppm

ACTIVATION PROCEDURE

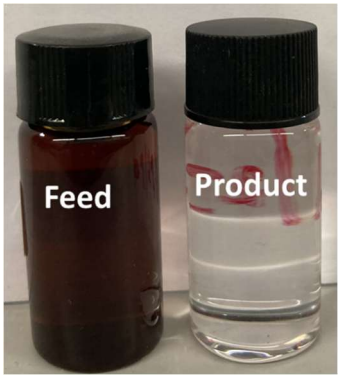
No additional activation required.

REGENERATION

Spent sorbent can be regenerated and recycled for desulfurization without appreciable loss of its initial activity. Both in-situ and ex-situ regeneration of the product are available.



AdESulfur-200 performance for Kerosene feed > 750 ppm, Liquid phase



311 E Lee St, Louisville, KY 40208 Phone: (502) 499-0095 Email: adem.louisville@gmail.com

ADEM ADVANCED ENERGY MATERIALS