

AdE-Scat™ -110A

Advanced Hydrodesulfurization Catalyst



WWW.ADVANCEDENERGYMAT.COM

Advanced Energy Materials, LLC (ADEM) has developed a new hydrodesulfurization catalyst “**AdE-Scat™-110A**” specifically for ULSD production. AdE-Scat™ represents a series of products using nanowire-based materials for high performance hydrodesulfurization applications.

ADEM introduces its new generation of HDS catalysts “AdE-Scat™” developed using improved production techniques after years of proven R&D and scaleup testing. AdE-Scat™ catalysts contain well dispersed, high density of active sites for higher activity at milder operating conditions.

AdE-Scat™-110A is a drop-in catalyst solution for moderate to high pressure hydrotreaters. This can process feeds with high refractory sulfur content, aromatics and unsaturates. AdE-Scat™-110A has been demonstrated to operate at mild to moderate operation conditions (pressure ~15-30 bar and temperature – 350 °C) making it a perfect solution for refiners dealing with issues in feedstock containing refractory S species. AdE-Scat™-110A catalysts are highly porous and non-sinterable due to one dimensional nature of nanowire based materials. The low temperature operation allows energy savings and longer lifetime for catalysts. These properties ensure the durability of AdE-Scat™-110A catalyst, reducing the number of change outs resulting in a significant cost savings in operational costs for the refiners.

AdE-Scat™-110A

Advanced Hydrodesulfurization Catalyst

Test results with AdE-Scat™-110A

| Test Parameter | Test I | Test II |
|------------------------------|--|--|
| Feed | Diesel | Diesel |
| Sulfur, ppmw | 1000 | 1200 |
| Sulfur species | Mercaptans (900 ppm) & Thiophene (100 ppm) | Thiophene (800 ppm), Benzothiophene, DBT, 4methylDBT, 4,6-DMDBT (400ppm) |
| H ₂ pressure, bar | 15 | 30 |
| H ₂ /Oil, SCFbbl | 930 | 1200 |
| LHSV, hr ⁻¹ | 1 | 1 |
| Temperature, °C | 350 | 350 |
| Product Sulfur, ppmw | 12±3 | 15±3 |

Application Areas

Feedstocks: Hydrodesulfurization of feedstocks such as Gasoline, Diesel, Kerosene, Light Cycle Oil, Gas oil, Waste lube oil re-refining and natural gas.

Hydrotreaters: AdE-Scat™-110A, an advanced hydrodesulfurization catalyst, has been developed specifically for hydrotreaters having issues with feeds having more difficult to remove sulfur species (DBT, 4-MDBT, 4,6-DMDBT). Test results shown in the table above demonstrates that AdE-Scat™-110A meets the 'S' specifications at low to moderate pressure 15-30 bar, and a low temperature of 350 °C. These conditions enable an increased catalyst life time.

Waste lube oil re-refining: AdE-Scat™-110A can be applied in hydrodesulfurization of waste lube oil re-refining, to produce base-II oils with S<300 ppmw at much low pressures and temperature than conventional re-refiners.

Natural gas desulfurization: Based on regulations, pipe line natural gas contains 6-10 ppm of organic sulfur, COS added as odorants. The 'S' present in the gas is detrimental to the reforming catalyst and must be reduced to <1 ppm before being processed for hydrogen/syngas production.

AdE-Scat™-110A is designed as a ULSD catalyst for refineries that operate at low pressures (15-30 bar).