CLEANOx®

Environmental Fluid Catalytic Cracking (FCC) catalyst shows excellent NO\textsubscript{x} reduction without altering dry gas make

BASF’s NO\textsubscript{x} adsorption and reduction additive, CLEANOx, shows NO\textsubscript{x} emissions reduction by 72% in refinery trial

Introduction

Using a novel combination of active materials for NO\textsubscript{x} adsorption and reduction, CLEANOx is a unique NO\textsubscript{x} abatement Fluid Catalytic Cracking (FCC) additive from BASF that has been used extensively in consent decree trials and demonstrations.

A refiner wants to reduce NO\textsubscript{x} emission from its FCC regenerator to meet air quality limits while ensuring no change to dry gas yields or FCC yields. CLEANOx at 1.4 wt% of fresh catalyst addition was chosen to reduce these emissions while still maintaining the unit’s profitability.

Results

CLEANOx’s performance met the unit’s expectations by:

- Allowing the unit to run consistently at lower NO\textsubscript{x} levels
- Reducing NO\textsubscript{x} emissions on average by 72%
- Providing excellent control of NO\textsubscript{x} emissions at the new lower level
- Showing no changes in H\textsubscript{2} or dry gas

Figure 1. CLEANOx reduced NO\textsubscript{x} in excess of 70%

<table>
<thead>
<tr>
<th>Commercial Trial Data of CLEANOx</th>
<th>Uncontrolled</th>
<th>CLEANOx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average NO\textsubscript{x} emissions, ppm</td>
<td>225</td>
<td>62</td>
</tr>
<tr>
<td>Dry gas</td>
<td>Base</td>
<td>No change</td>
</tr>
<tr>
<td>Coke make</td>
<td>Base</td>
<td>No change</td>
</tr>
<tr>
<td>Product yield slate</td>
<td>Base</td>
<td>No change</td>
</tr>
</tbody>
</table>
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.

BASF - We create chemistry

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