INDEPENDENT CATALYST TESTING FOR REFINERIES

Still testing in the traditional way?
Evaluate commercial catalysts and optimize your operation.

- Independent catalyst and process evaluation
- Screening of relevant process conditions using your feedstocks
- Scientific consulting & data interpretation

Your benefits with hte

ESTABLISHED MARKET POSITION
- High data quality & reproducibility
- Excellent reputation with major oil companies
- Largest independent 3rd-party refinery testing lab worldwide

ADVANCED TECHNOLOGY
- Feed processing flexibility – from naphtha to residue and waxy feedstocks
- Advanced analytics and software solutions
- Multiple test reactors for optimized catalyst selection with high statistical significance
- Accelerated customer-specific catalyst deactivation test

EASY TO WORK WITH
- NDAs with major catalyst vendors
- Short lead times
- Highly cost- and time-efficient
- Technical consulting
- Frequent project updates with full transparency
- Experienced staff – refinery services & support mentality

BENCHMARK CATALYST TESTS FOR MANY REFINING PROCESSES:
- HYDROTREATING (HDS, HDN, HDA, HDO, HDM, ULSD)
- HYDROCRACKING
- RESID HYDROPROCESSING
- DEWAXING
- CATALYTIC NAPHTHA REFORMING
- ISOMERIZATION
- BIOFEEDSTOCK CONVERSION / BIOFUELS
- AND OTHERS

A subsidiary of BASF – We create chemistry
**Advanced Reactor Systems and Analytical Tools**

- **Sulfur / Nitrogen**
- **Vanadium / Nickel / Iron**
- **Simulated Distillation**
- **Total Hydrogen (by NMR)**
- **Cetane Index**
- **D86 Boiling Range**
- **Density / API Gravity**
- **Dynamic Viscosity**
- **Cloudpoint / Pourpoint**
- **Aromatics (by HPLC)**
- **In-house distillation capabilities**

**EXEMPLARY RESULTS**

**CASE STUDY A: CATALYST RANKING**

<table>
<thead>
<tr>
<th>Catalyst</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature [°C] @ 60 % UCO-Conversion</td>
<td>Base +16 °C +/- 0.6 °C</td>
<td>Base +9°C +/- 0.1 °C</td>
<td>Base +9°C +/- 0.1 °C</td>
<td>Base +/- 0.1 °C</td>
</tr>
<tr>
<td>Yield Gas (C1-C4) [%]</td>
<td>4.2</td>
<td>6.2</td>
<td>3.6</td>
<td>3.4</td>
</tr>
<tr>
<td>Yield Naphtha [%]</td>
<td>26.2</td>
<td>30.2</td>
<td>25.5</td>
<td>25.5</td>
</tr>
<tr>
<td>Yield Kerosene [%]*</td>
<td>17.1</td>
<td>13.8</td>
<td>17.6</td>
<td>18</td>
</tr>
<tr>
<td>Yield Diesel [%]*</td>
<td>18</td>
<td>15.6</td>
<td>18.5</td>
<td>18.3</td>
</tr>
<tr>
<td>Selectivity to middle distillates [%]*</td>
<td>74.7 +/- 0.4</td>
<td>66.6 +/- 0.3</td>
<td>75.3 +/- 0.3</td>
<td>75.0 +/- 0.3</td>
</tr>
</tbody>
</table>

*Boiling range Kerosene & Diesel ≠ boiling range middle distillates

**CASE STUDY B: MASS BALANCE**

![Graph of Mass Balance](image)

**CASE STUDY B: PRETREAT NITROGEN SLIP VS. TEMPERATURE**

![Graph of Pretreat Nitrogen Slip vs. Temperature](image)

**CASE STUDY B: YIELD DIESEL VS. UCO CONVERSION**

![Graph of Yield Diesel vs. UCO Conversion](image)

hte REFERENCES