SINOPEC Optimization Ethylene Technologies
More Flexible, Productive and Profitable

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Self Introduction

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Figures of Sinopec


Main Business

- Oil/gas field exploration and production
- Refining
- Petrochemicals production
- Oil products sales and distribution

In 2016

- Crude oil 303.51 MMbbls, Natural gas 766.12 Bcf
- Crude throughput 235.53 Mtons
- Ethylene 11,059 Ktons
- Synthetic resin 15,201 Ktons
- Sales of refined oil 194.84 Mtons
CBL Cracking Technology

- Can realize valuable cracking and increase feedstock flexibility.
- Furnace capacity: Up to 200 KTA.
- 123 furnaces built with total capacity 11.8 Mt.
- Total number of gas furnace 26 with total capacity 2.74 Mt.
Feed flexibility
From ethane to HVGO

SERT - Enhanced heat transfer technology

Radiant coil - High selectivity coil

Cracked gas quench
- Linear quench cooler

Firing + I.D Fan
Question

1. What kind of technology is applied in your steam cracking furnace to extend the run length and reduce the coking?
Goal-Extend the run length

How

• Insert the tube integrated with inside twisted-tape into the reaction tube of the radiation.
• To change the flow pattern of the fluid body
• Hydrocarbon feedstock is impelled from plug flow to swirling flow
• Flow velocity along the tube perimeter is increasing

Results

- Thinner boundary layer
- Reduce Tube Metal Temperature (TMT)
- Reduced coking rate
Swirling Element Radiant Tube (SERT)

Advantages

- Furnace Installed: > 98%
- TMT: -20℃
- Run Length: +40%
- Capacity: +7%
C1 - Low Temperature Methanation Catalyst
High activity in low temperature 150 ~ 200°C. Adapting to various reactor and process

C2 - Selective Hydrogenation Technology
• Front-end Selective Hydrogenation Technology for Removal of Acetylene in Depropanizer Process

C2 - Selective Hydrogenation Technology
• Tail-end Selective Hydrogenation Technology for Removal of Acetylene in C2 Fraction

C3 - Selective Hydrogenation Technology
• Liquid-phase Selective Hydrogenation Technology for the Removal of Methyl Acetylene and Propadiene in C3 Fractions
C1/C2/C3 Catalysts & Processes

Commercial Application Overseas (BC-L-83)

Commercial Application Overseas (BC-H-20B)

Cooperate with LUMMUS in C3 Technology

SABIC UK

Middle East
Question

1. How to make the refinery off-gas more value-added and what is your plan?

2. Do you think your plan is more optimized and economically reasonable?
Technology to Recover Refinery Off-gas

Goal-Enhance the competitiveness of the refinery

- Oil absorption the ethylene-rich gas from FCC dry gas
- More competitive than cryogenic separation, PSA
- C2-rich to caustic washing
- Refinery C4 fraction to absorb C2, stable gasoline to recover the losing C4 entrained by fuel gas.
Technology to Recover Refinery Off-gas

High Recovery of Ethylene
- 92% C2 recovery

Simple Process
- Conventional and less equipments, no need of adsorbent

Stable Operation
- Simple operation, stable running, long operation cycle

Less Floor Area
Sinopec has unique CBL steam cracking technology with SERT to realize value cracking, which can improve the competitiveness of the cracking unit greatly.

Catalysts with high activity and selectivity ensure a high efficient ethylene purification and separation process.

C2 recovery from refinery off-gas by COAT technology can largely increases the comprehensive utilization of resources.
Q&A
Together, we move toward!