ATA-21Next and ATA-41: Latest-Generation Trans-Alkylation Catalysts

SHELL CATALYSTS & TECHNOLOGIES
TRANSFORMING ENERGY TOGETHER

Contents

AT A GLANCE

CUSTOMER DRIVERS

To meet demand for benzene and xylenes produced from cheaper and heavier feedstocks, aromatics plant operators require a catalyst with high activity and selectivity that uses the lowest amount of energy to reduce carbon dioxide (CO_2) emissions.

SOLUTION

A single-bed drop-in solution, the ATA series is an established leader in trans-alkylation offering highly stable activity and performance in the treatment of heavy feedstocks.

VALUE DELIVERED

Highly differentiated trans-alkylation catalysts with improved stability and standout activity and selectivity. Low aromatic/feed loss because of catalyst's selective hydrogenation function. Strong de-alkylation by zeolite and metal enables high conversion of heavies and suppresses make of coke precursors.

PROOF POINT

The ATA series has a 20+ year track record. In that time 1,700 tons has been loaded into 31 units. Reliable start up every time.

ATA-21Next and ATA-41 catalysts are used in aromatics complexes in the toluene disproportionation unit or trans-alkylation unit when conversion of toluene and C9+ aromatics to mixed xylenes and benzene is required. Processing C9+ aromatics in a trans-alkylation unit shifts the chemical equilibrium in the unit away from benzene production and towards xylene production. The trans-alkylation process provides a means of producing more mixed xylenes from low-value toluene and heavy aromatics. The incorporation of a trans-alkylation unit into an aromatics complex can more than double the yield of paraxylene from naphtha feedstock.

Operational flexibility is offered, with ATA-41 requiring pre-sulphiding, while ATA-21Next requires no pre-sulphiding.

ATA-21Next and ATA-41 provide:

- high product selectivity (low by-product formation);
- catalyst stability and longer cycles;
- high conversions (less recycle);
- low operating temperatures (saving energy);
- high benzene purity that meets today's industry standards.

In addition, ATA-21Next and ATA-41 provide the opportunity to treat 100% C9A+, as shown in Figure 1.

A selective hydrogenation function preserves the aromatic content of the feed, reducing hydrogen consumption and the production of small hydrocarbon molecules, along with associated greenhouse gas emissions.

Light hydrocarbon and CO_2 emissions contribute to value loss and climate change, and they waste valuable resources. ATA-21Next and ATA-41 can help plant owners meet their commitments to eliminate or reduce such emissions at their facilities and improve sustainability.

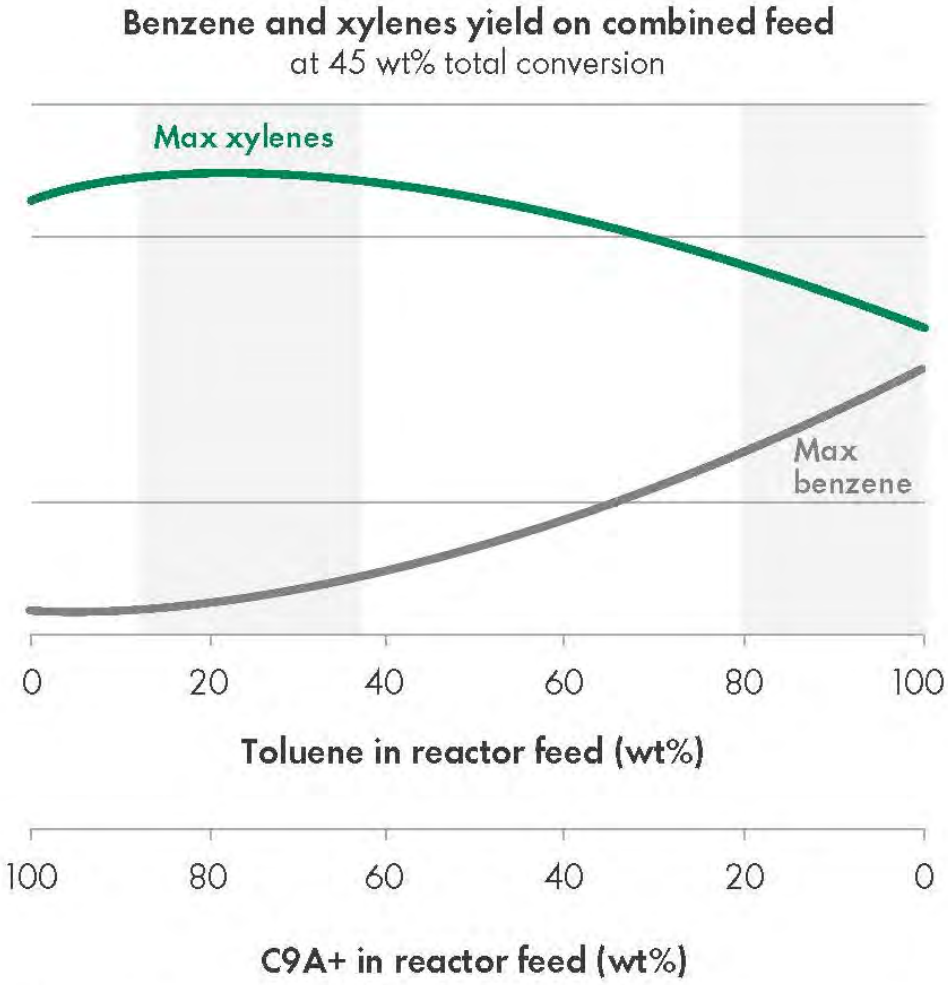
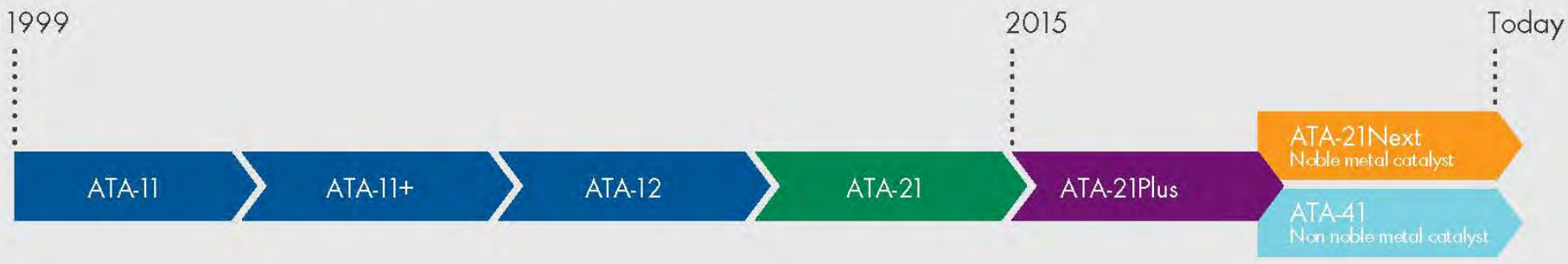


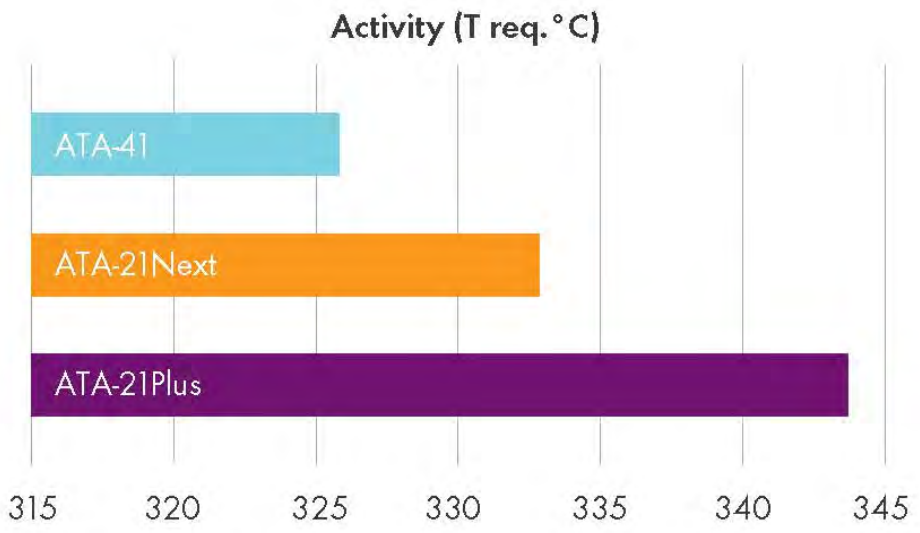
Figure 1: ATA-21Next and ATA-41 enable heavy feed processing, which helps in the upgrading of lower value feedstocks into higher value products.

ESTABLISHED TRANS-ALKYLATION TRACK RECORD SINCE 1999



PERFORMANCE DATA

ATA-21Next and ATA-41 offer standout activity and selectivity, as shown in Figures 2 and 3.



Based on standard feed and operating conditions.

Figure 2: ATA-21Next and ATA-41 require 10 °C and 17 °C lower temperatures than our previous generation catalyst, ATA-21Plus.

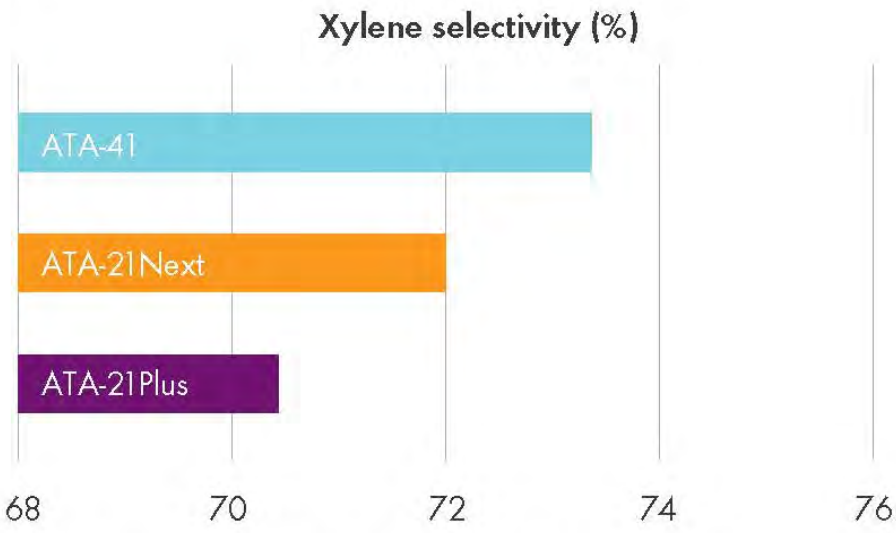


Figure 3: ATA-21Next and ATA-41 can make 2% and 3% more xylene than our previous generation catalyst, ATA-21Plus.

OPERATIONAL FLEXIBILITY

ATA-21Next	ATA-41
A zeolite-based catalyst with a noble metal function for high trans-alkylation and de-alkylation activity.	A zeolite-based catalyst with a non noble metal function for high trans-alkylation and de-alkylation activity.
High product selectivity, high stability and high conversion of heavies.	Maximum performance.
Does not require pre-sulphiding (enables faster start-up).	Pre-sulphiding required, and Shell Catalysts & Technologies can help customers to apply this.
Single-bed drop-in solution.	Single-bed drop-in solution.

OPERATIONAL FLEXIBILITY IS OFFERED, WITH ATA-41 REQUIRING PRE-SULPHIDING, WHILE ATA-21NEXT REQUIRES NO PRE-SULPHIDING.

To read more about
“ATA-21Next and ATA-41:
Latest-Generation
Trans-Alkylation Catalysts”
click the link above.