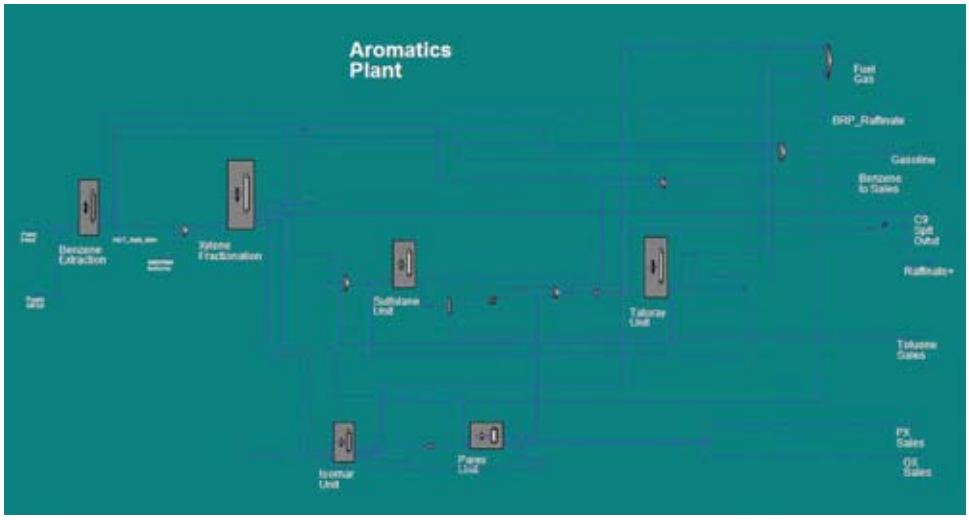
AROM-SIM™

Reactor Models for Petrochemical Processes

a KBC SIM Model

AROM-SIM is the KBC family of reactor models that simulate xylene isomerisation and aromatics transalkylation. These reactors, along with other standard Petro-SIM™ unit operations, can provide you with a detailed model of aromatics processing facilities.



Aromatics Flowsheet

The isomerisation of C_8 aromatics into paraxylene is performed using the AROM-SIM Xylene Isomerisation reactor model. It can model technologies such as Isomar™, XyMax™, and Oparis™ (licensed by UOP, Exxon Mobil Corporation, and Axens respectively) among other licensor technologies. The model includes both mechanisms for transalkylation of ethylbenzene (EB) to xylenes and dealkylation of EB to benzene.

Transalkylation processes are modelled with the Aromatics Transalkylation reactor model. This model is capable of emulating all commercial transalkylation processes such as UOP Tatoray™, THDA, and PX-Plus™ as well as Exxon Mobil Corporation/Axens TransPlus™, PxMax™ among other licensor technologies. The model includes kinetic reactions for dealkylation, toluene disproportionation and C_9/C_{10} aromatics transalkylation, plus the many additional reactions that take place.

For specified feeds, operating conditions, and constraints, the program determines resulting product flows and compositions as well as overall unit operating economics.

FEATURES

AROM-SIM contains the following key features:

- Kinetic model consisting of primary and side reaction equations for isomerisation and transalkylation
- Linear or weighted distribution of energy use along the reactor
- Auto-tuning or manual tuning capability
- Detailed compositional model output with stream properties
- Case studies and optimisation capabilities to determine maximum performance
- Easy to use LP Data Utility to create LP shift vectors and submodels
- Integration with other refinery units using Petro-SIM, to model interaction between these units, reformers, and other key operations

Petro-SIM FLOWSHEET

AROM-SIM is available within Petro-SIM and Petro-SIM Express, the KBC process flowsheet simulator. You can model each reactor as an individual unit, model them in the same flowsheet or model with upstream and downstream units to determine key interactions over a section or the entire facility.

(Continued)

BENEFITS

AROM-SIM is a decision support tool to help answer the following questions:

- **Selection of Operating Targets** – How do I maximise the amount of paraxylene? What is the effect of ethylbenzene conversion on xylene isomerisation? How can I best control the amount and quality of recycle?

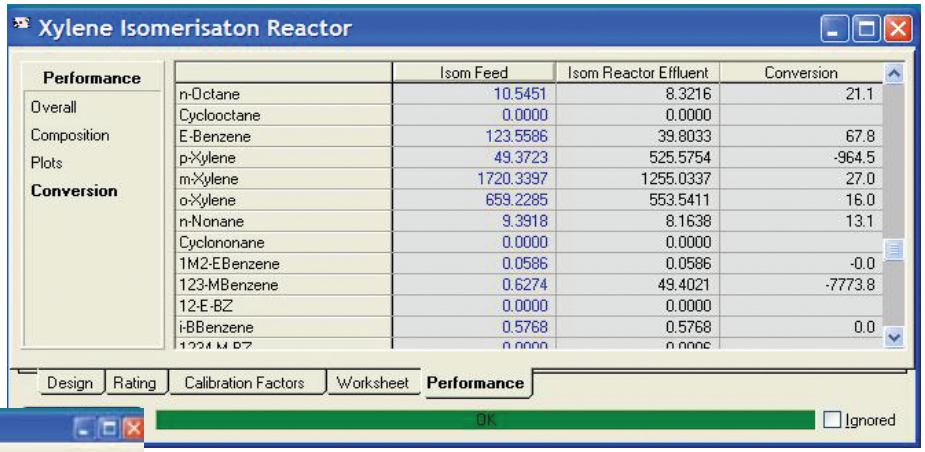
- **Evaluation of New Feedstocks or Upstream Operations** – What are the effects of a new feed on product qualities and yields? How does a change in feed naphthenes affect my process? What are the best feestocks to the transalkylation unit?

- **LP Submodel Generation** – What vectors are needed in the linear program (LP) to model the incremental yields for different feeds and operating conditions?

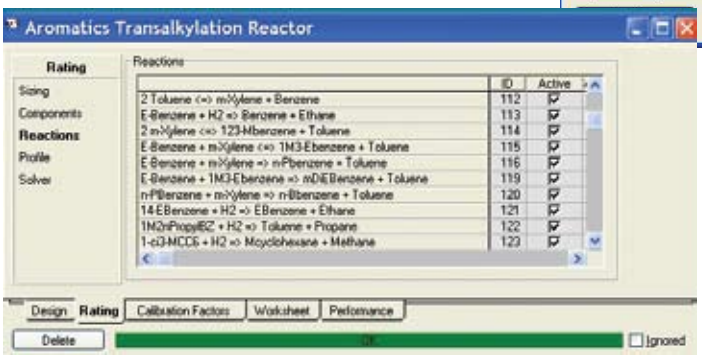
- **Debottlenecking** – What are the economic effects of increasing the Hydogen to hydrocarbon ratio? What are the effects of changing reactor pressures or conversion levels?

- **Training** – How do I get new engineers and operators up to speed?

- **Design** – What is the best configuration for a new facility?



Aromatics Isomerisation Reactor



Aromatics Transalkylation Reactor

PREDICTIVE TECHNOLOGY FOR PROFIT IMPROVEMENT

- Petro-SIM™ for Process Simulation
- KBC SIM Suite:
  - FCC-SIM™ for Fluid Catalytic Cracking
  - REF-SIM™ for Catalytic Reforming
  - HCR-SIM™ for Hydrocracking
  - N HTR-SIM™, D HTR-SIM™ and VGO HTR-SIM™ for Hydrotreating
  - DC-SIM™ for Delayed Coking

- Petro-SIM *Express*™ for Process Simulation
  - VIS-SIM™ for Visbreaking and Thermal Cracking
  - ALK-SIM™ for Alkylation
  - RHDS-SIM™ for Residue Hydrotreating
  - AROM-SIM™ for Aromatics
  - ISOM-SIM™ for Isomerisation
  - Olefin-SIM™ for Pyrolysis

KBC Software Solutions

www.kbcat.com • www.petro-sim.com • software@kbcat.com

AMERICAS +1 281 293 8200 • ASIA +65 6735 5488 • EMEA +44 (0) 1932 242424