Aromatics Complex Operations Course: BTX Extraction, Xylene Isomerisation and Paraxylene Separation

25 – 29 January 2027
London - Central London four-star



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Introduction:

Aromatics complex operations, covering BTX extraction, xylene isomerisation and paraxylene separation, is a 1-week course for process and technical-service engineers who run units downstream of the reformer, ending with an Aromatics Complex Debottleneck and Optimisation Plan for a case site. Paraxylene output is lost when extraction solvent degrades, transalkylation conversion drifts, isomerisation falls short of equilibrium and adsorption chambers lose selectivity without anyone linking the symptoms across units. Nominees already monitor extraction, toluene conversion or xylene loop units, and learn through modelling builds on case mass balances. CoreConcept Training Center delivers this aromatics complex operations course.

Course Objectives:

- Trace reformate and pyrolysis gasoline components through extraction, toluene conversion and the xylene loop to locate where paraxylene yield is lost
- Set solvent-to-feed ratio, extractor temperature and solvent regeneration duty to hold benzene and toluene recovery and purity
- Adjust toluene disproportionation and transalkylation severity, hydrogen ratio and C9 aromatics feed to balance benzene and xylene make
- Operate xylene isomerisation and paraxylene recovery by adsorption or crystallisation against purity, recovery and recycle targets
- Diagnose adsorbent selectivity loss, catalyst deactivation, solvent foaming and benzene emission events and choose corrective action
- Build an Aromatics Complex Debottleneck and Optimisation Plan from a case mass balance with ranked yield and energy moves

Target Audience:

- Engineers responsible for daily monitoring of sulfolane extraction and clay treating units
- Engineers responsible for toluene disproportionation and transalkylation reactor settings and catalyst performance
- Engineers responsible for xylene isomerisation and paraxylene adsorption or crystallisation sections
- Technical-service staff responsible for test runs, mass balances and unit performance reports in aromatics plants
- Shift and area engineers responsible for benzene handling, sampling and vapour control on aromatics units

Course Outline:

Day 1: Aromatics Complex Configuration, Feed Quality and Unit Baseline

- Reformate and Pyrolysis Gasoline Feed Composition for Aromatics Recovery
- Block Flow of Extraction, Toluene Conversion and Xylene Loop
- Reformate Splitter and Xylene Column Cut Point Selection
- Clay Treater Bromine Index Control for Olefin Removal
- Complex Baseline Review of Yields, Energy Use and Downtime

Day 2: Sulfolane Extraction, Toluene Disproportionation and Transalkylation

- Sulfolane Liquid-Liquid Extraction Versus Extractive Distillation Route Choice
- Solvent-to-Feed Ratio and Extractor Temperature for Aromatics Recovery
- Sulfolane Degradation, Acid Formation and Solvent Regenerator Operation
- Toluene Disproportionation Zeolite Chemistry and Benzene Purity Targets
- Transalkylation of Toluene With C9 Aromatics and Hydrogen Ratio

Day 3: Xylene Isomerisation and Paraxylene Recovery Operations

- Ethylbenzene Dealkylation Versus Ethylbenzene Isomerisation Catalyst Selection
- Isomerisation Reactor Approach to Equilibrium and Xylene Loss Tracking
- Simulated Moving Bed Rotary Valve Step Time Settings
- Desorbent Recovery, Extract Purity and Raffinate Recycle in Adsorption
- Paraxylene Crystallisation Refrigeration, Eutectic Limit and Centrifuge Wash

Day 4: Xylene Loop Troubleshooting, Benzene Handling and Energy Optimisation

- Adsorbent Hydration and Selectivity Loss Diagnosis in Adsorption Chambers
- Isomerisation Catalyst Deactivation, Coke Build-Up and Regeneration Timing
- Sulfolane Unit Foaming, Corrosion and Solvent Loss Investigation
- Benzene Exposure Control, Closed Sampling and Vapour Recovery Practice
- Xylene Column Heat Integration and Reboiler Duty Reduction Options

Day 5: Modelling Build and Aromatics Complex Debottleneck Plan

- Case Complex Mass Balance From Reformate to Paraxylene Product
- Xylene Loop Recycle Ratio and Bottleneck Unit Identification
- Extraction and Transalkylation Yield Uplift Option Screening
- Energy and Benzene Handling Improvement Action Register
- Aromatics Complex Debottleneck and Optimisation Plan Completion

Skills You Will Gain:

- Aromatics Mass Balancing
- Sulfolane Solvent Management
- Transalkylation Severity Control
- Xylene Loop Recycle Analysis
- Simulated Moving Bed Operation
- Paraxylene Crystallisation Control
- Benzene Vapour Control

Why Attend This Course:

- Deliver an Aromatics Complex Debottleneck and Optimisation Plan to the complex manager and technical-service lead for the next turnaround and budget round
- Decide whether falling paraxylene output calls for an adsorbent, isomerisation catalyst, extraction or recycle correction first
- Avoid off-specification benzene, lost paraxylene recovery and unplanned solvent replacement caused by late detection of drifting unit data
- Coach junior engineers and console staff on reading extraction, transalkylation and xylene loop trends using the course mass balance templates

Conclusion:

Back at the site, the participant hands the complex manager and technical-service lead an Aromatics Complex Debottleneck and Optimisation Plan built on a mass balance from reformate to paraxylene. Unit engineers use it to set solvent, reactor and adsorption targets and to rank which bottleneck to remove first, while planners use its yield and energy moves to prepare turnaround scope. After the first quarter under the plan, the unit should compare paraxylene recovery, benzene purity, solvent losses and reboiler duty with the baseline and revise targets that missed.

Frequently Asked Questions FAQ:

What should participants know before the aromatics complex operations course?

Participants should already monitor or support extraction, toluene conversion or xylene loop units and be able to read process flow diagrams and laboratory results. Anonymised unit data, a recent test run report or a mass balance from their own site helps them apply the modelling exercises.

How does aromatics complex operations training differ from a refinery and petrochemical integration course?

This course works at unit level inside the aromatics complex: solvent, reactor, adsorption and crystallisation settings and their troubleshooting. Integration courses compare site configurations and investment options, while reformer and cracking courses stop at reformate production; both appear here only as feed context.

Why does paraxylene recovery fall in aromatics complex operations?

Paraxylene recovery usually falls because the adsorbent has picked up water or contaminants, desorbent quality has drifted, rotary valve timing no longer matches feed composition, or isomerisation is running far from equilibrium and loading the loop with recycle.

What do participants take back from the aromatics complex operations course?

Participants take back an Aromatics Complex Debottleneck and Optimisation Plan for a case site, with a reformate-to-paraxylene mass balance, a bottleneck ranking, yield and energy options and a benzene handling action register ready to adapt to their own units.