Optimization of Naphtha Feedstock Blending for Integrated Olefins-Aromatics Plant Production Scheduling

Y. Ota, K. Namatame, H. Hamataka, K. Nakagawa and H. Abe
Mitsubishi Chemical Corporation

A. Cervantes, I. B. Tjoa and F. Valli
MC Research & Innovation Center
Hierarchy of Decisions in Business Activities

Optimization efforts for improving profitability

Here we focus on production scheduling
Issues in Ethylene Plant Production Scheduling

Model requirement:
- Accurate (rigorous) daily production model
- Mixed Integer Nonlinear model

Main Focus:
Find *optimal feedstock allocation* for daily production scheduling, for meeting production demands
Case Study: Real Production Scheduling for 2 Ethylene and 2 Benzene Plants

Production target?

Optimal composition?

How to meet Production Objective?
Modeling and Solution Approach

**Modeling approach**
- Unit operation model building capability
- Equation based modeling approach
  - MINLP model
- Modeling platform: GAMS modeling language
- Model size
  - Continuous variables \(\sim 60k\)
  - Binary variables \(\sim 1k\)

**Solution approach**
- Process knowledge based decomposition strategy
- Use standard solvers:
  - MILP: OSL
  - NLP: ConOpt
Naphtha Inventories

- Fixed ETY & PPY Demands
- Max ETY & PPY Productions

![Graphs showing the comparison between Base and Opt scenarios for Naphtha Inventories.](image-url)
Application Manager