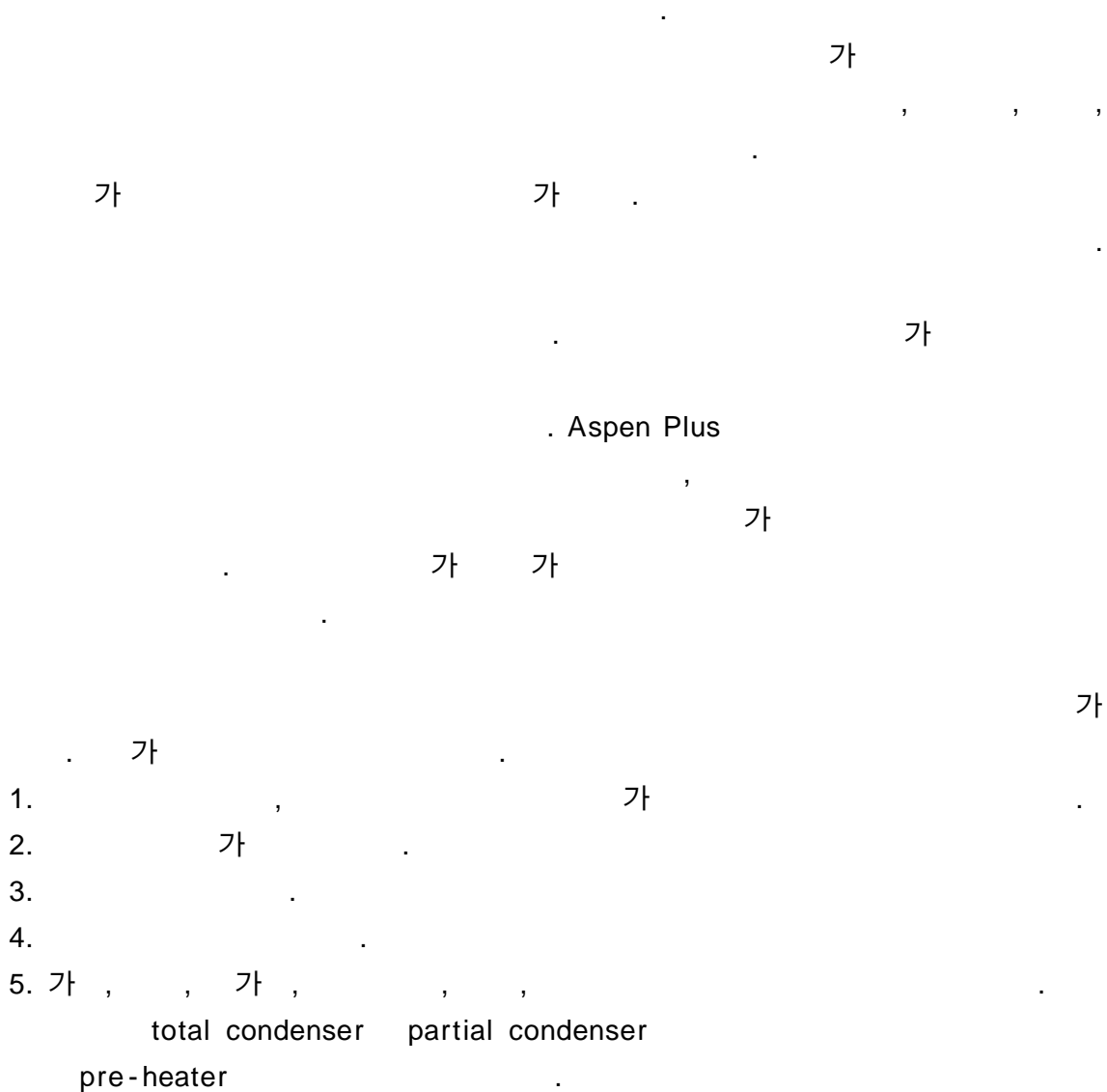


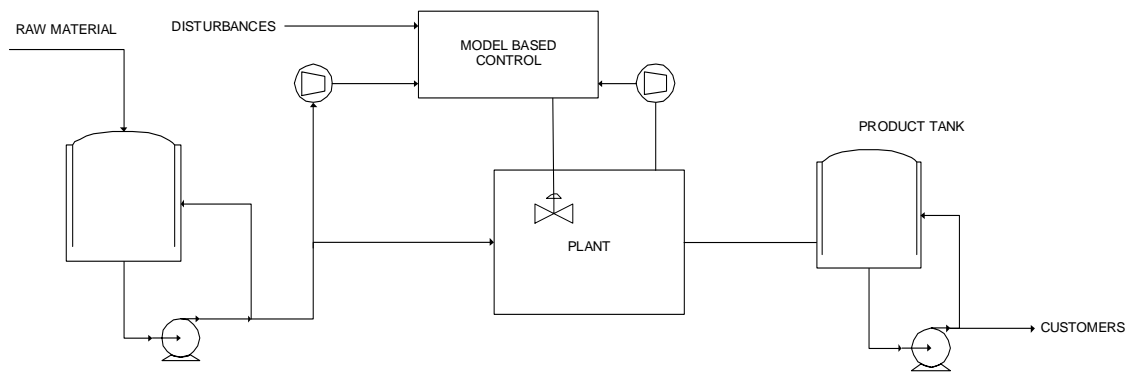
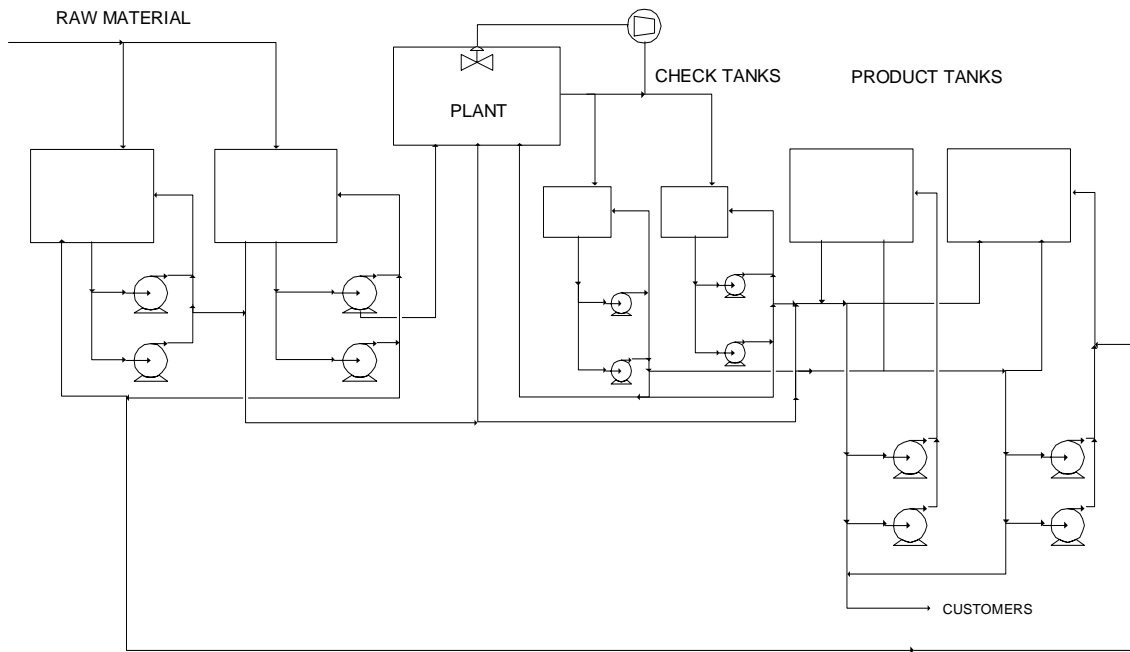
Process Intensification

(Process Intensification)

2



1. Reactive distillation
 2. Reactive extrusion
 3. Internal cooling, reflux cooling, recycle cooler
 4. Side stream, divided wall column, 가
- . (2)



1. Minimize components, first pass prime, single components

5. Preheating evaporation

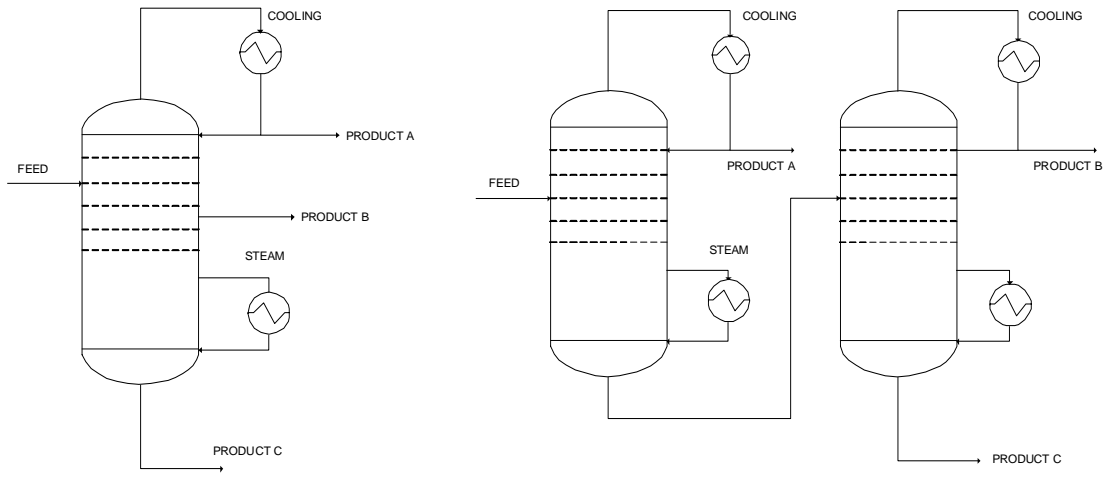
6. Coalescing settling operation

7. reflux condenser

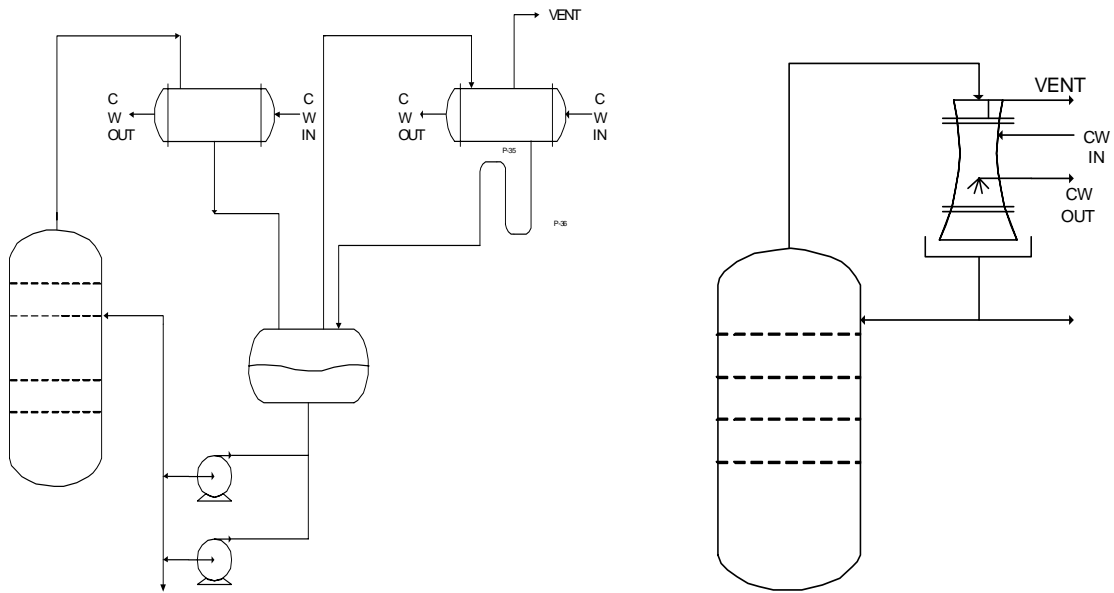
8. reflux drum, reboiler, demister, knock out drum, vent

condenser

. (3)

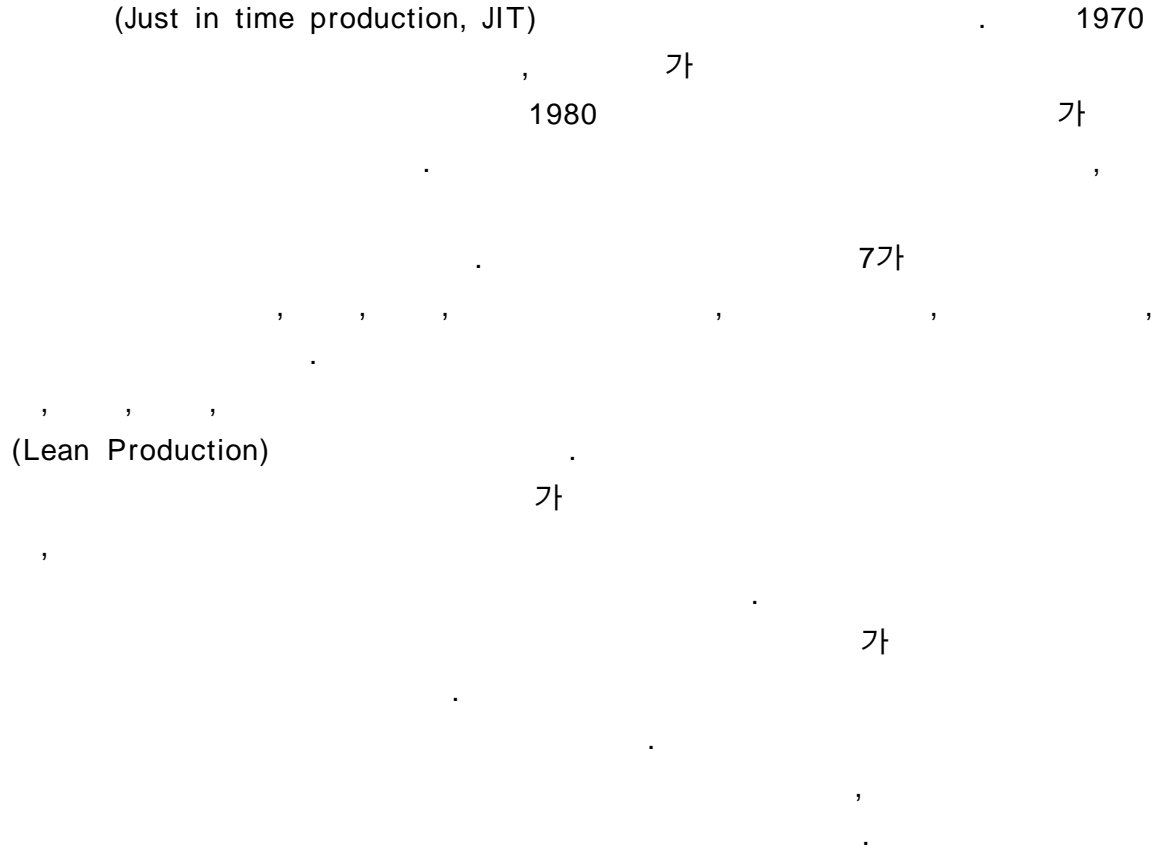


2. A divided wall column versus two sequential distillations



3. Distillation column with condenser, vent condenser and reflux drum not integrated and integrated

Just in Time Production



Value Improvement Practices

5

Business Planning ()



Alternatives Analysis (,)



Front-end Engineering (basic engineering, 가,)



Execution (detail engineering,)



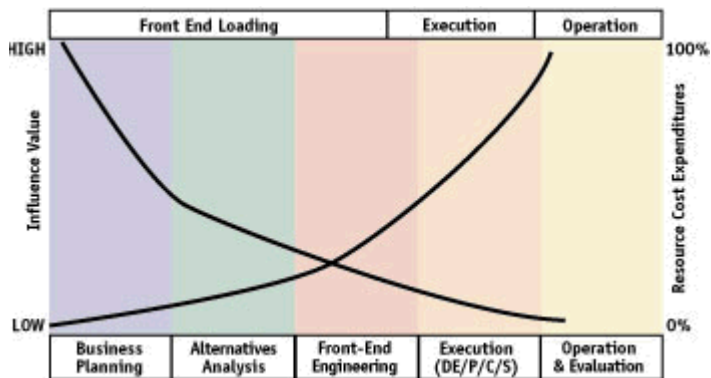
Operation and Evaluation (가 , 가)



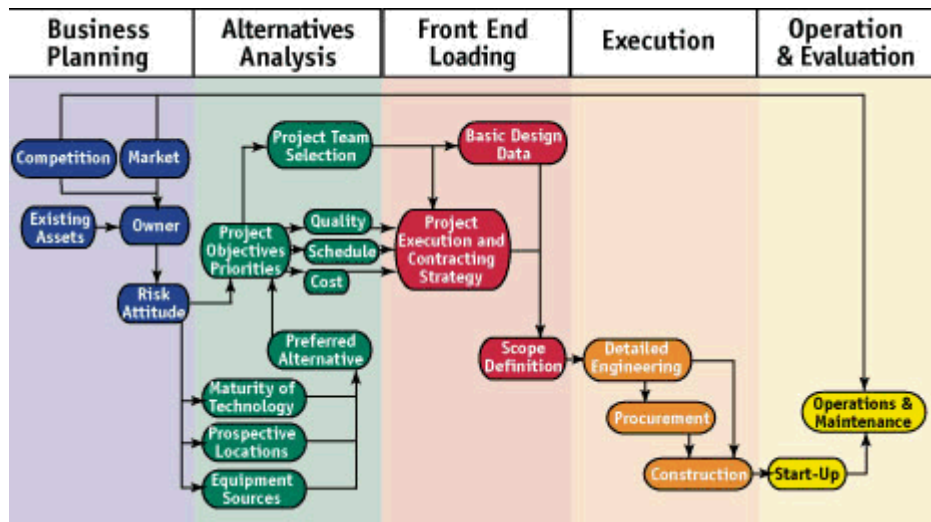
가

가

가



4. Influence curve



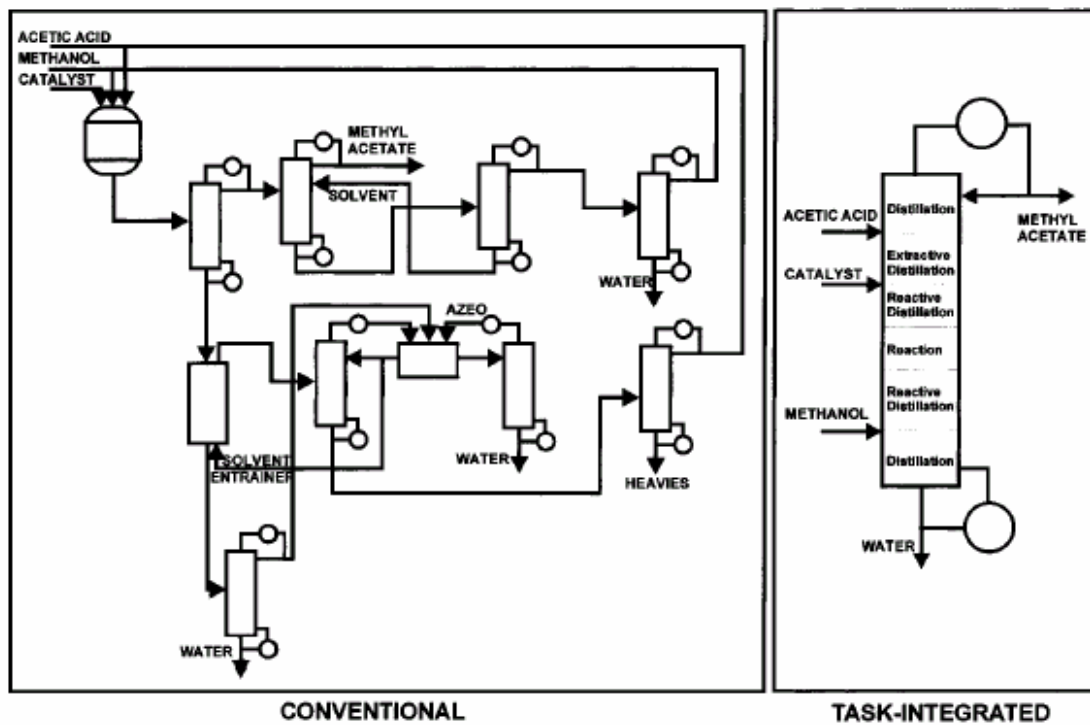
5. Project Influence Diagram

VIP (Value Improvement Practices)

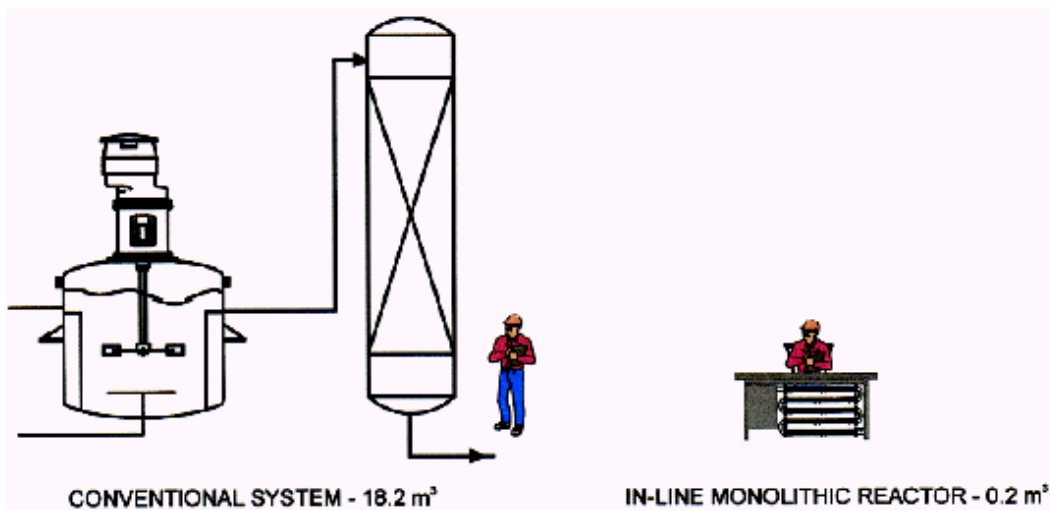
| | |
|---|--|
| VIP | |
| Class of Plant Quality | |
| Technology Selection | 가. |
| Process Simplification | non-revenue producing, non-value adding processes |
| Process Reliability Modeling | computer simulation , 가 |
| Design To Capacity | specifications |
| Waste Minimization | |
| Customized Standards and Specifications | 가 |
| Predictive Maintenance | |
| Energy Optimization | |
| Facility Optimization | |
| Design Tools | |
| Constructability | business requirements Front-End Engineering Development Phase Plant Safety, Maintenance, Operations, and Start-up. , |
| Value Engineering | Front End Engineering process (about 20% of design) |

Process Intensification

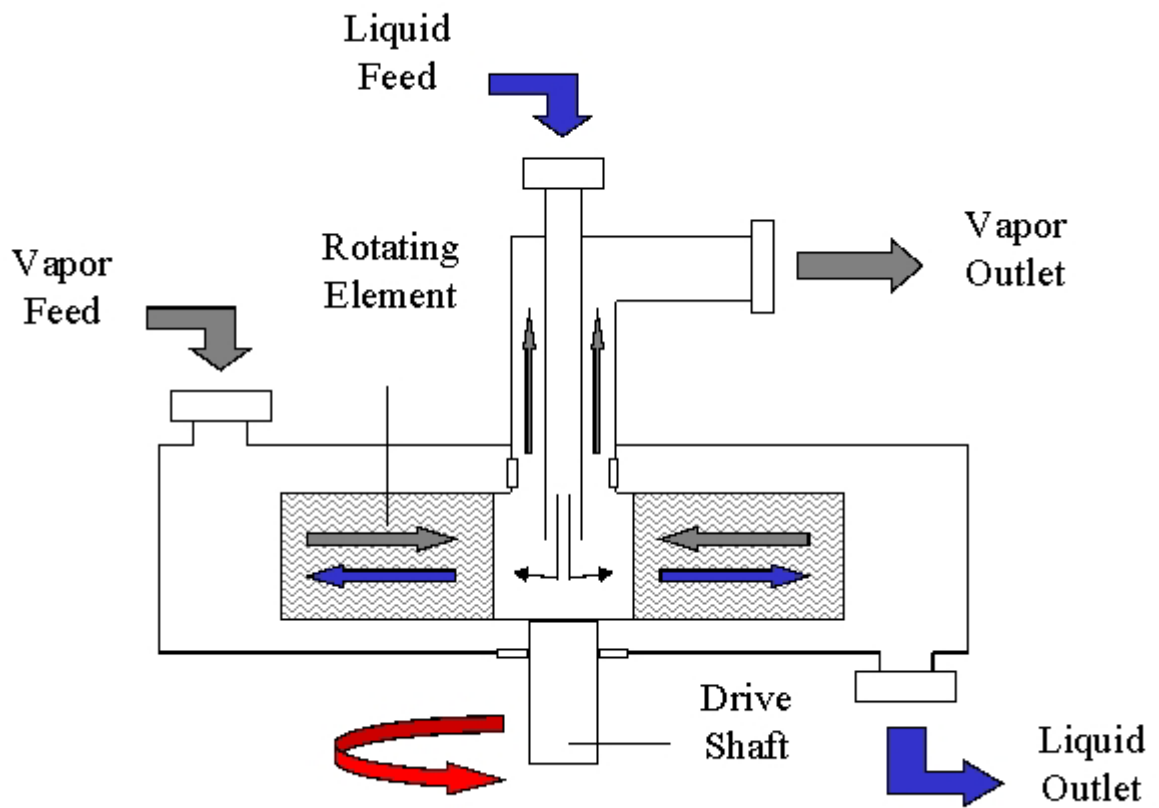
Eastmann Methyl acetate



DSM 18.2 m³ pack-bed reactor in-line monolithic reactor
 . 0.2 m³ .



ICI 가 HiGee Technology rotating equipment
 Shengli Oil Field 30 150 , 180
 rotating stripper . 2001 HoGee rotating packbed
 reactor Dow chemical Hypochlorous acid process



CDTech

Catalytic Distillation
"Texas teabag"

MTBE

selective FCC Gasoline sulfur reduction

