

Lecture 8.

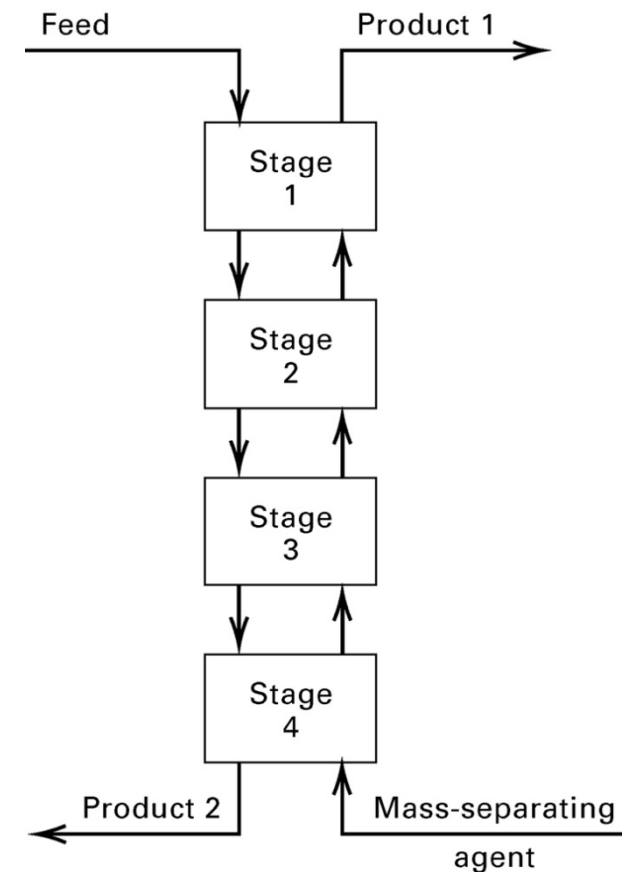
Cascades

[Ch. 5]

- Cascades
- Cascade Configurations
 - Single section of stages
 - Two sections of stages

Cascades

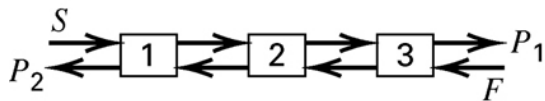
- **Cascades**: aggregates of stages
 - accomplish separations that cannot be achieved in a single stage
 - reduce the amounts of MSA or ESA required
 - make efficient use of raw materials
- Two or more streams are intimately contacted
 - promote rapid mass and heat transfer
 - the separated phases leaving the stage approach equilibrium



Cascade Configurations (1)

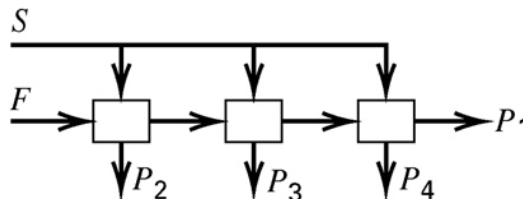
- Single section of stages
 - streams entering and leaving are only from the ends
 - used to recover components from a feed stream

Linear countercurrent



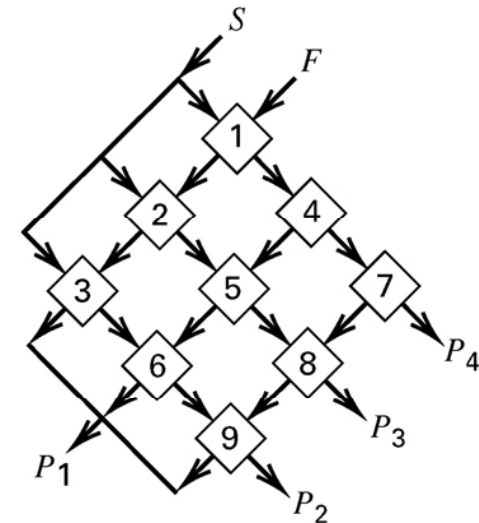
- Very efficient and widely used

Linear crosscurrent



- Not as efficient as the countercurrent cascade
- Convenient when the solvent is fed individually to each stage

Two-dimensional diamond

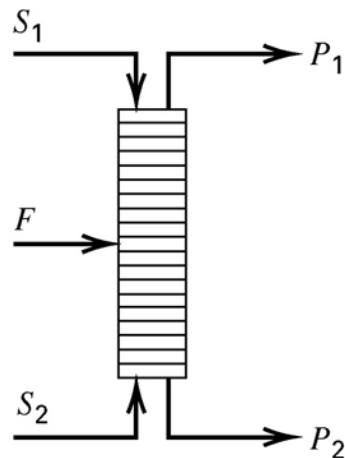


- Can be used in crystallization

Cascade Configurations (2)

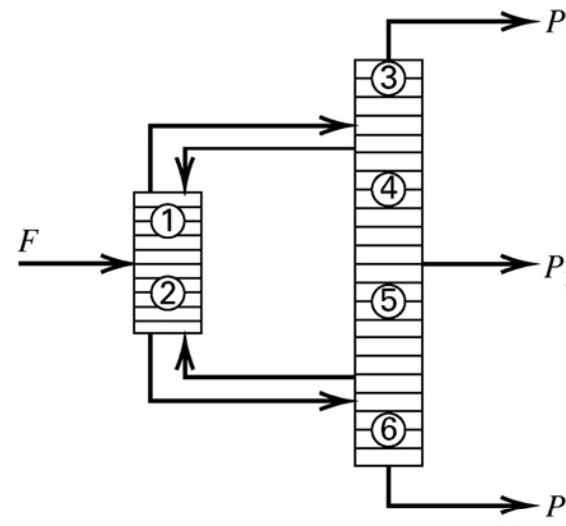
- Two sections of stages
 - consist of one section above the feed and one below
 - used to make a sharp separation between two selected feed components, key components

Two-section,
countercurrent



– Distillation / fractional liquid-liquid extraction

Interlinked system of
countercurrent



– Two distillation columns, six countercurrent cascade sections