Double effect evaporator

EVV/2000

Continuous concentration by double effect evaporation using 2 level of pressure:

1st stage at atmospheric pressure

2nd stage under vacuum

GENERAL SPECIFICATIONS

- Feeding tank.
- Metering pump.
- Glass shell evaporator, internal SS tube.
- SS refrigerant
- Glass cyclone.
- Solenoid valve.
- 2 glass shell evaporator, internal SS tube.
- Glass cyclone for vapor separation.
- Glass graduated receiver with draining valve and vacuum connectior
- Diaphragm vacuum pump, diaphragm PTFE.

Instrumentation

- Temperature probes Pt100Ω.
- Flowmeter.
- Vacuum gauge.
- Manometer.
- Level sensor

Categories: CHEMICAL PROCESSING EDUCATIONAL ENGINEERING EVAPORATION

Reference: EVV/2000

Description

The evaporation

The purpose of evaporation is to vaporize the solvent in order to enrich the solute in the solution.

At the end of the operation the substance recovered is known as the concentrate.

A conventional evaporator is heated by steam which condenses and transmits heat energy to the solution to be evaporated.

As this solution boils it in turn releases vapor which may:

- Either be condensed in a condenser, in which case the process is known as “single effect” evaporation.

- Or be used to heat another evaporator, in which case it is known as “multiple effect”.

In theory an unlimited number of evaporators may be associated in series in this way.

In industry evaporation is used to :

- Obtain crystallized sugar, concentrated milk, concentrated fruit juices, paper pulp.

Observe the steps of the process

Evaporation and climbing phenomenon

Separation of a liquid-vapour mixture in a cyclone

Condensation

Choose operating conditions and study their influence

Reduced or atmospheric pressure

Feed rate and steam flow rate

Single or double effect

Monitor the process

Thermal and material balance

Yield