

Cooling of Benzene and Heating of Methane by Circulation of water

Shashi Kiran and S V Karthik
Department of chemical engineering
National Institute of Technology Warangal
Email ID:sd2@student.nitw.ac.in

Flowsheet Description:

- Benzene and Methane which are cooled and heated are sent into the heater and cooler.
- Water which is medium to exchange heat from benzene and methane is sent to the heater and increases its temperature by taking heat from the Benzene and enters in the Mixer and then in the separator which separates vapour/liquid water into saturated vapour and liquid.
- Saturated vapour enters into the cooler and turns into saturated liquid and recycled to the mixer.
- Saturated liquid from the separator is also recycled in to the mixer.
- Heat released in the mixer is used to increase the temperature of the Methane.

Unit Operations :

1. Heater
2. Cooler
3. Separator
4. Material streams
5. Energy streams
6. Mixer

Results:

Components	Feed inlet (kg/h)	Temperature inlet (centigrade)	Temperature outlet (centigrade)	Pressure (bar)
Benzene	15.6228	500	300	2
Methane	3600	100	260	2
Water	43.32	254.763	275.614	60

component	Feed inlet (Kg/h)	Mass flow outlet (Kg/h)	
		Saturated liquid (kg/h)	Saturated vapour (kg/h)
water	43.32	38.988	4.332

Reference:Introduction To Material and Energy Balance ;Chapter Number:9;Example Number :5.