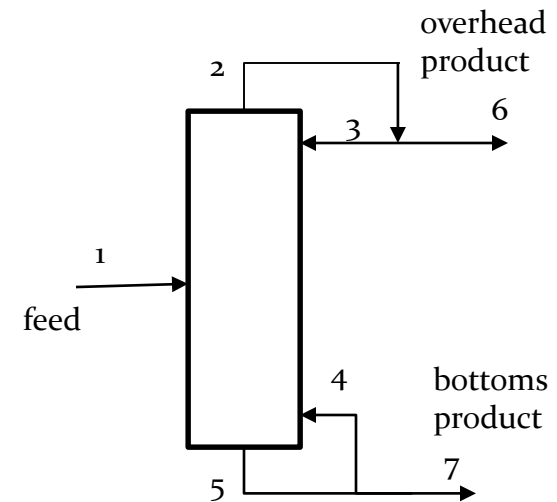


PE2:50-53

It is desired to remove 95% of the propylene from a gas stream composed of propane, butane, and pentane. A distillation tower is used to make this recovery. The composition of the feed and bottom product streams are given in the following table.

component	Feed (wt%)	Bottoms (wt%)
Propane	20	10
Propylene	25	5
Butane	35	15
pentane	20	70



PE2:50

- If the feed stream mass flow rate is 1500 kg/h, what is most nearly the total mass flow rate of the bottoms stream?

Sol. PE2:50

- $F=1500$ kg/h, $B=18.75/0.05=375$

Component	Feed, 1	Bottoms, 7	Overhead, 6	
Propane	$0.20(1500) = 300$	$0.1(375)=37.5$	$300-37.5 = 262.5$	
Propylene	$0.25(1500) = 375$	$375-356.25=18.75$	$0.95(375)= 356.25$	
butane	$0.35(1500) = 525$	$0.15(375) = 56.25$	$525-56.25= 468.75$	
pentane	$0.20(1500) = 300$	$0.70^*375=262.5$	$300-262.5 = 37.5$	
Total	1500	375	$1500-375= 1125$	