Quiz 3

Problem 1: Consider a distillation column with a feed of 10 gmol/s benzene, 20 gmol/s o-xylene and 15 gmol/s toluene at 101.33 kPa and 383 K.

- For a benzene recovery of 98%, what is the minimum number of trays if the ratio of benzene to o-xylene in the overhead is 100? Find the bottoms and tops compositions.
- Periodically a small amount of H_2S appears in the feed. Since it is undesirable to have this component in the product, explain *qualitatively* how you would design and operate this column to separate the H_2S.
- An overhead product of 55% benzene, 40% toluene and 5% o-xylene is recovered as saturated liquid. Can cooling water at 310 K be used if the column operates at 200 kPa?

Antione Equation:

$$log_{10}(P) = A - \frac{B}{T + C}$$

where P is the vapor pressure in kPa and T is the temperature in K.

Compound	A	B	C
Benzene	6.06832	1236.034	-48.990
Toluene	6.12072	1374.901	-15.440
o-Xylene	6.13132	1480.155	-58.804