

Bonus – Extra Problem A

The associated link provides a plot for the vapor-liquid equilibrium data for 1-propanol (P) – water (W) at 1 atm.

100 kgmol/h of a 15% (mol%) solution of 1-propanol is a saturated vapor and is fed into a distillation column. The goal is to generate a distillate of 65% 1-propanol and a bottoms of 2% 1-propanol.

- a) Draw the q-line.
- b) What is the minimum reflux ratio that is theoretically possible to achieve this separation.?
- c) If the reflux ratio is 5, draw the operating lines for the rectifying section and the stripping section. What number of stages is needed to accomplish this separation? At what stage should the feed occur?
- d) Is it possible to distill this mixture at these conditions to obtain a distillate of 75% 1-propanol? Explain.

1-Propanol - Water Equilibrium

