CHE 362 **HW #13** **Due 6/28/23**

Acetone is to be extracted from a water solution using TCE in a multistage countercurrent extractor. The feed enters at 20 mol% acetone at 25°C at a rate of 100 kmol/hr. Pure TCE is fed to the extractor at 25°C. The mole fraction of acetone in the raffinate stream is to be 1 mol%.

#1 Create an X-Y (mole ratio) diagram using the equilibrium data from HW #12. Use the X-Y diagram to find the minimum extract feed rate. Show your solution on the diagram. Determine the number of stages required if the solvent is fed at 1.5 times the minimum solvent rate. Show your solution on the X-Y diagram.

#2 Simulate the extractor in Aspen using the solvent rate and number of stages from the X-Y diagram. Submit a screen shot of the stream results showing the molar flow rates and mole fractions of the streams. If the specification of the mole fraction of acetone in the exiting raffinate stream is not met, adjust the solvent feed rate to meet the spec. Submit a screen shot of the stream results showing the molar flow rates and mole fractions of the streams.