

CHE 305 – Separation Processes
Spring 2010 – In Class Exercise on Single Stages

When the relative volatility is approximately constant, the following equation can be used to generate an XY phase diagram.

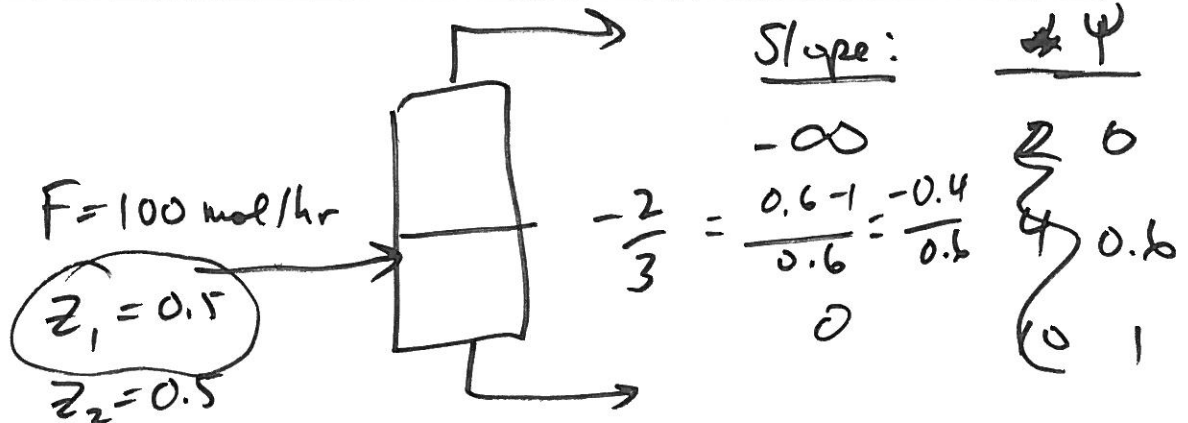
$$y_1 = \frac{\alpha_{12} x_1}{1 + x_1(\alpha_{12} - 1)}$$

The attached XY phase diagram gives VLE data for the following values of the relative volatility (α_{12}): 2, 4, and 10.

100 moles/hr of an equimolar binary mixture is to be separated in a single stage (flash). Draw the q-lines for operation at the bubble point, 60 % vaporization, and the dew point. Determine the compositions of the exiting liquid and vapor streams at 60% vaporization for each curve.

	Relative Volatility		
Composition	2	4	10
x_1	0.39	0.29	0.18
x_2	0.61	0.71	0.82
y_1	0.56	0.63	0.7
y_2	0.44	0.37	0.3

60% } (handwritten bracket on the left side of the table)



$$\text{Slope} = \frac{\psi - 1}{\psi}$$

XY Phase Diagram for In Class Exercise on Single Stages

