

**CHE 305 – Separation Processes**  
**Spring 2010 - Quiz 3**

Use the attached XY phase diagram for a system of pentane and heptane to answer the following questions. The feed flow rate to the single stage flash is 200 moles/hr, and 70 mole % of the feed is heptane.

1. Draw a picture of the system, labeling all streams and identifying key variables (flow rates, stream mole fractions).
2. Draw a q-line for operation at 50% vaporization.
3. What are the outlet vapor and liquid mole fractions (both components)?
4. What are the outlet vapor and liquid mole fractions for an equimolar feed at 30% vaporization?

**Q-Line:** 
$$y_i = \left( \frac{\Psi - 1}{\Psi} \right) x_i + \left( \frac{1}{\Psi} \right) z_i$$