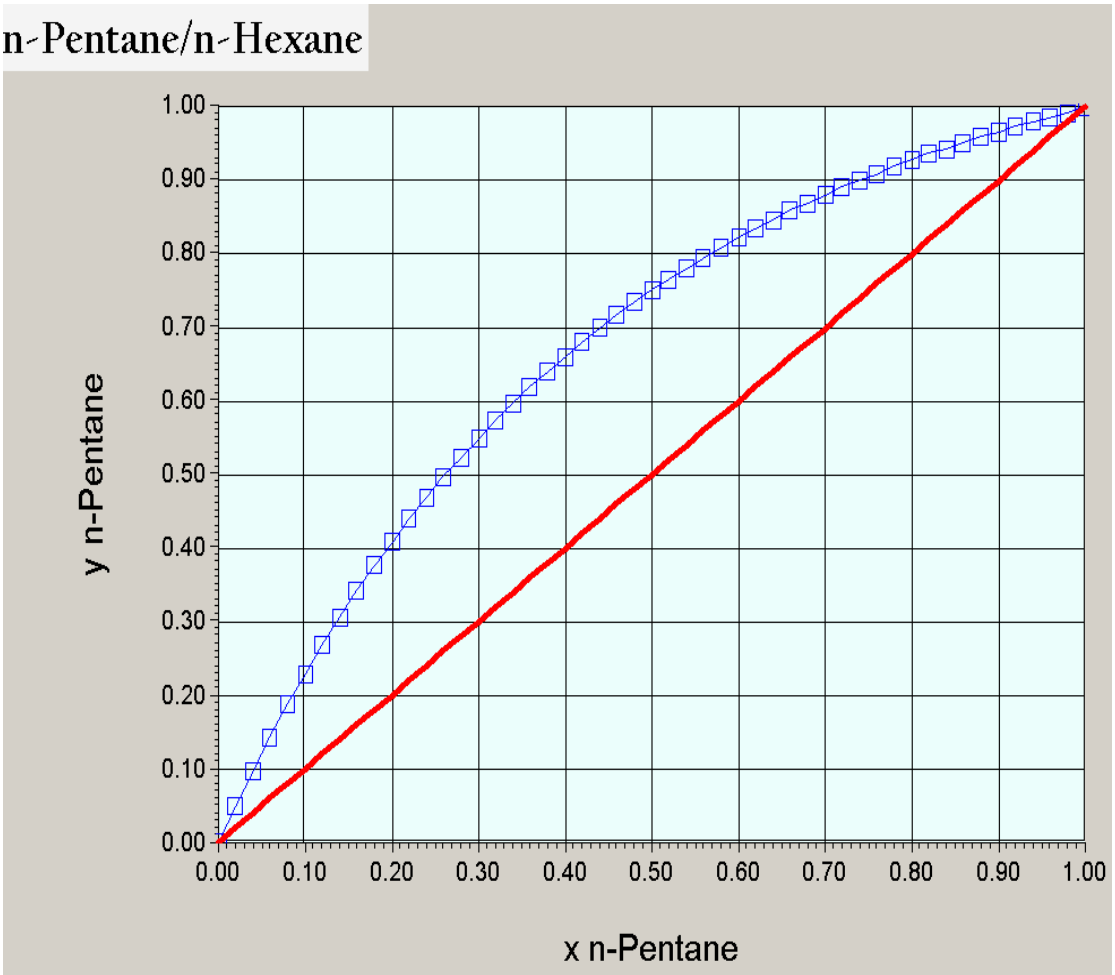
03 VLE Curves

1/ The diagram below shows a vapour liquid equilibrium (vle) diagram for a mixture of n-pentane and n-hexane at 100kPa.
Use the diagram to answer the following questions:

i) What is the mole fraction in n-pentane of the vapour phase when the mole fraction in n-pentane of the liquid phase is 0.6?
ii) What is the mole fraction in n-hexane of the liquid phase when the mole fraction in n-pentane of the vapour phase is 0.2?
iii) What is the mole fraction in n-hexane of the liquid phase when the mole fraction in n-hexane of the vapour phase is 0.7?
iv) Calculate the relative volatility of n-pentane in n-hexane when the liquid mole fraction of n-pentane is 0.4
v) What would happen to this vle curve if the pressure was decreased?



2/ Separation of i-Pentane and i-Butane

The diagram below shows the VLE plot for i-Pentane and i-Butane at 1000kPa.

Use the diagram to answer the following questions:

i) What is the mole fraction in i-Butane of the liquid phase when the mole fraction in i-Butane of the vapour phase is 0.7?

ii) What is the mole fraction in i-Butane of the liquid phase when the mole fraction in i-pentane of the vapour phase is 0.5?

iii) What is the mole fraction in i-pentane of the vapour phase when the mole fraction in i-pentane of the liquid phase is 0.4?

iv) Calculate the relative volatility of i-pentane in i-Butane when the liquid mole fraction of n-pentane is 0.35