Unit 11 - Week 9: Vapour - Liquid Equilibria of Multicomponent Non-Ideal Systems

Assessment 9

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-04-01, 23:59 IST.

1) According to Raoult's law for gas or solution if the pressure is low and all intermolecular forces are approximately small then, *4 points*

- Vapour and liquid phases can be treated as ideal
- Vapour and liquid phases can be treated as non-ideal
- Vapour is ideal and liquid phases is non-ideal
- Vapour is non-ideal and liquid phases is ideal

No, the answer is incorrect.
Score: 0
Accepted Answers:
Vapour and liquid phases can be treated as ideal

2) The expression $y_i P = x_i P_i^{sat}$, is called Raoult's law, where P_i^{sat} depends on *4 points*

- Only temperature
- Composition
- Temperature and pressure of system
- Pressure

No, the answer is incorrect.
Score: 0
Accepted Answers:
Only temperature

3) The expression $y_i P = x_i P_i^{sat}$, is called Raoult's law can be written as $y_i = K_i x_i$, where K_i is known as K-value of species "i" and it depends on *4 points*

- Temperature only
- Composition only
- Temperature and pressure of system
- Pressure

No, the answer is incorrect.
Score: 0
Accepted Answers:
Temperature and pressure of system

4) Select the correct statement. *4 points*

- Phase diagram are useful for identifying thermodynamic state of a binary mixture
- Tie lines are horizontal because the pressure of liquid and vapour are the same
- In phase diagram, liquid mole fraction vs pressure line is often termed as the bubble point curve
- All of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
All of the above

5) Antoine equation is a relation between *4 points*

- Temperature and vapour pressure
- Temperature and composition
- Composition and vapour pressure
- Density and Temperature

No, the answer is incorrect.
Score: 0
Accepted Answers:
Temperature and vapour pressure

6) For gas and liquid phases in equilibrium, a component in a non-ideal system follows the relation, *4 points*

- $y_i P = x_i P_i^{sat}$
- $f_i^V = f_i^L$
- $f_i^V = y_i P$
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
$f_i^V = f_i^L$

7) Select the correct statement *4 points*

- The first drop of liquid is formed when a superheated vapour mixture is isothermally compressed.
- In phase diagram, vapour mole fraction vs pressure curve is known as 'dew point' curve.
- The tie line ties together the composition of liquid and vapour phases.
- All of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
All of the above

8) A mixture of A and B follows Raoult's law. The pure component vapours pressure P_A^{sat} and P_B^{sat} in bar are given by temperature in K. *4 points*

$\ln P_A^{sat} = 9.2164 - \frac{2766.63}{T+(-48.78)}$ and $\ln P_B^{sat} = 9.2131 - \frac{2477.07}{T+(-39.94)}$

If the bubble point of a certain mixture of A and B is 330K at a total pressure of 1 bar. Find the composition of A.

- 0.825
- 0.676
- 0.248
- 0.125

No, the answer is incorrect.
Score: 0
Accepted Answers:
0.676

9) Which of the following expression shows Lewis-Randall law for non-ideal system, where γ_i is the activity coefficient and ϕ_i is the fugacity coefficient of species "i". *4 points*

- $y_i P = x_i \gamma_i P_i^{sat}$
- $y_i P = x_i P_i^{sat}$
- $y_i P = x_i \varphi_i P_i^{sat}$
- $y_i P = \gamma_i P_i^{sat}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$y_i P = x_i \gamma_i P_i^{sat}$

10) An azeotrope occurs, when there is same *4 points*

- Bubble point
- Boiling point
- VLE composition
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
VLE composition

11) Select the correct statement *4 points*

- At azeotrope, the mole fraction of each species in the liquid phase is equals to that in the vapour phase.
- Azeotrope is 'more likely' to occur when saturation pressures of two components have large difference.
- Azeotropes are less common in binary mixtures with large differences in saturation pressures.
- Option (a) and (c)

No, the answer is incorrect.
Score: 0
Accepted Answers:
Option (a) and (c)

12) An example of minimum azeotrope is *0 points*

- Water and ethanol
- Water and Benzene
- Benzene and Ethanol
- All of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
Water and ethanol