

### Assignments Week-4

1. The liquid form of a pure substance A contained in a sealed vessel in which it is in equilibrium with its vapor form. The correct statement about its chemical potential is:

- (A) The chemical potential of A in its vapor form is higher than that in its liquid form
- (B) The chemical potential of A in its vapor form is lower than that in its liquid form
- (C) The chemical potential of A in its vapor form is equal to that in its liquid form
- (D) The chemical potential of A in its vapor form is zero

2. In an ideal solution, the slope of the plot of vapor pressure of solvent against its mole fraction is

- (A) Vapor pressure of pure solute
- (B) Vapor pressure of pure solvent
- (C) Molality of the solution
- (D) Temperature of the solution

3. In a solution formed by mixing two liquids, positive deviations from ideality are observed if

- (A) The dipolar interactions between solute and solvent molecules are weaker than those between solute-solute and solute-solvent molecules
- (B) Solute-solvent do not interact with each other
- (C) The dipolar interactions between solute and solvent molecules are stronger than those between solute-solute and solute-solvent molecules
- (D) Either the solute or the solvent is non-volatile

4. If both the solute and solvent obey Raoult's law, the solution is

- (A) An ideal solution
- (B) A non-ideal solution
- (C) An ideal dilute solution
- (D) A regular solution

5. If the free energy of mixing of two liquids is always positive, the resulting solution is

- (A) Immiscible form of mixture of both the liquids
- (B) Miscible form of both the liquids
- (C) Partially miscible form of both the liquids
- (D) In vapor form of both the liquids

6. Which of the following does not depend upon temperature?

- (A)  $\Delta_{\text{mix}}G$
- (B)  $\Delta_{\text{mix}}S$
- (C)  $\Delta_{\text{mix}}H$
- (D)  $G(\text{excess})$
- (E)

7. Excess functions are indicative of

- (A) Intermolecular interactions operating in solution
- (B) Non-ideality exhibited by solution
- (C) Ability of liquids to mix
- (D) Significant deviation of activity coefficient from unity

8. If water is mixed with ethanol, excess enthalpy is expected to be

- (A) Positive
- (B) Negative
- (C) Zero
- (D) Either positive or negative depending upon temperature

9. Existence of intermolecular interaction in a solution can be confirmed by measuring

- (A) Heat capacity of solution
- (B) Gibbs energy of mixing
- (C) Volume change upon mixing
- (D) Change in molecular weight of mixing liquids

10. Entropy of mixing of two liquids will not change if

- (A) Temperature is changed
- (B) Pressure is changed
- (C) Volume is changed
- (D) Amount of mixing liquids is changed