Unit 10 - Week 8 Lectures

Assignment 8

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

Due on 2019-09-25, 23:59 IST.

1) Entropy change of mixing for ideal gas
   - $> 0$
   - $< 0$
   - $>> 0$
   - none of these

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   none of these

2) Fugacity of ideal gas mixtures is equal to
   - Total pressure
   - Partial pressure
   - Vapor pressure
   - All of these

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

3) Le Chatelier rule applies to each species in an ideal solution at all conditions of
   - Temperature
   - Pressure
   - Composition
   - All of these

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

4) A binary gas mixture contains 25 mol % A and 75 mol % B. At 50 bar total pressure and 100 °C temperature the fugacity coefficients of A and B in the mixture are, respectively, 0.85 and 0.8. What is the fugacity of the gaseous mixture?
   - 18.2 bar
   - 22.3 bar
   - 41.5 bar
   - 33.8 bar

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

5) At 25 °C and 1 bar partial pressure, the solubility of ethane in water is very small; the equilibrium mole fraction is $X_{C2H6} = 0.33 \times 10^{-4}$. At 25 °C, the compressibility factor of ethane is given by the empirical relation $Z = 1 - 7.63 \times 10^{-3} T - 7.23 \times 10^{-5} P$, where P is in bar. What is the solubility of ethane at 25 °C when the partial pressure is 30 bar? Given, at 25 °C, the saturation pressure of ethane is 42.97 bar and that of water is 0.0316 bar
   - 5.47 \times 10^{-4}
   - 6.47 \times 10^{-4}
   - 7.47 \times 10^{-4}
   - 8.47 \times 10^{-4}

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   8.47 \times 10^{-4}

6) The second virial coefficient of a certain gas is given by $B = -a \sqrt{T}$, where $a$ and $b$ are constants. The change in internal energy for this gas in going at temperature $T_b$ from very low pressure to a pressure $n$, would be? Use the equation $Z = 2nRT + 1 + BnRT$.
   - $-a n^2 / T_b^2$
   - $2an / T_b^2$
   - $an / T_b^2$
   - $-a / T_b^2$

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   $-an / T_b^2$