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Courses » Introduction to Chemical Thermodynamics and Kinetics

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Unit 9 - Week 7

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Assignment 7

The due date for submitting this assignment has passed.

As per our records you have not submitted this **Due on 2019-03-20, 23:59 IST.**
assignment.1) Calculate molal depression of freezing point of water at 1 atm. Given **1 point**
 $\Delta H_f = 1440 \text{ cal mol}^{-1}$.

- 1.85 K kg mol⁻¹
- 185 K kg mol⁻¹
- 5 K kg mol⁻¹
- 1 K kg mol⁻¹

No, the answer is incorrect.**Score: 0****Accepted Answers:****1.85 K kg mol⁻¹**2) Calculate the osmotic pressure at 27°C of a solution obtained by **1 point**
dissolving 1 g of glucose and 1 g of sucrose in 1 L of water.

- 0.209 atm
- 5 atm
- 500 atm
- 10 atm

No, the answer is incorrect.**Score: 0****Accepted Answers:****0.209 atm**3) The Henry-law constant for O₂ and N₂ at 0°C in water are 1.9×10^7 **1 point**
and 4.1×10^7 mm respectively. Calculate the freezing point of pure water.
Water kept in presence of air containing 80% N₂ and 20% O₂ by volume at 1
atm freezes at 0°C given $k_f = 1.86$

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No, the answer is incorrect.**Score: 0****Accepted Answers:***0.0024 °C*

4) 100 g benzene, 100 g toluene and 10 g naphthalene are mixed together to form a homogeneous solution. The vapour pressure of pure benzene is 118.5 mm at 30°C. If 5 L of dry air is passed through the solution what amount of benzene will be vapourized? **1 point**

- 1.282 g
- 5 g
- 50.282 g
- 100.282 g

No, the answer is incorrect.**Score: 0****Accepted Answers:***1.282 g*

5) At 25°C the vapour pressure of water is 23.79 mm of Hg. 5 g of a non-electrolyte solid is added to 100 g water and the vapour pressure decreases to 23.44 mm. Calculate the molecular weight of the solute **1 point**

- 6.32 g
- 60.32 g
- 100 g
- 20.62 g

No, the answer is incorrect.**Score: 0****Accepted Answers:***60.32 g*

6) 10 g of a non-volatile solute A is dissolved into 100 g benzene. At 25°C, a given volume of dry N₂ is bubbled through the solution and then through the pure solvent. The loss of weight for the solution and the pure solvent be respectively 1.115 g and 0.025 g. Find out the molecular weight of the solute A. **1 point**

- 346.75
- 3000
- 3436
- 5031

No, the answer is incorrect.**Score: 0****Accepted Answers:***346.75*

7) What proportions of A and B should be mixed by mole fraction in order to achieve the greatest entropy of mixing? (Assuming A and B form ideal solutions) **1 point**

- 1.0
- 0.5
- 0.3

0.7

No, the answer is incorrect.

Score: 0

Accepted Answers:

1.0

8) Consider a container of volume 2.0 dm^3 that is divided into two compartments of equal size. In the left compartment there is a gas A at 1.0 atm and 25°C ; in the right compartment there is a gas B at the same temperature and pressure. The value of Gibbs energy of mixing when the partition is removed is given by (Assume that the gases are perfect) 1 point

-0.35 J

-35 kJ

-35 J

-0.14 kJ

No, the answer is incorrect.

Score: 0

Accepted Answers:

-0.14 kJ

9) Assuming ideal behavior, determine $\Delta_{\text{mix}} S_m$ (Molar entropy of mixing) when 270.0 g of sugar with molar mass 358 g mol^{-1} is dissolved in 1.0 kg of water at 298 K . 1 point

$0.915 \text{ J mol}^{-1} \text{ K}^{-1}$

$0.591 \text{ J mol}^{-1} \text{ K}^{-1}$

$0.880 \text{ J mol}^{-1} \text{ K}^{-1}$

$0.321 \text{ J mol}^{-1} \text{ K}^{-1}$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$0.591 \text{ J mol}^{-1} \text{ K}^{-1}$

10) For a solution, Raoult's law is obeyed for 1 point

a solvent when it is in almost pure form

a solvent at any concentration of the solute

a solute when it is in almost pure form

a solute at any concentration of the solute

No, the answer is incorrect.

Score: 0

Accepted Answers:

a solvent when it is in almost pure form

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