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1. The molality of pure water is

- (a) 55.5
- (b) 50.5
- (c) 18
- (d) 60.5

### Answer/Explanation

Answer: a

Explanation:

(a) Molality = Number of moles/kg of solvent

$$= \frac{\frac{1000}{18}}{\text{kg of solvent}} = 55.5 \text{ moles/kg}$$

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2. The number of moles of NaCl in 3 litres of 3M solution is

- (a) 1
- (b) 3
- (c) 9
- (d) 27

### Answer/Explanation

Answer: c

Explanation:

(c) 3M solution means 3 moles in 1 litre.

∴ 9 moles in 3 litre.

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3. 4L of 0.02 M aqueous solution of NaCl was diluted by adding one litre of water.

The molality of the resultant solution is \_\_\_\_\_. [NCERT Exemplar]

- (a) 0.004
- (b) 0.008
- (c) 0.012
- (d) 0.016

### Answer/Explanation

Answer: d

Explanation:

(d)  $M_1V_1 = M_2V_2$

$$0.02 \times 4 = M_2 \times (4 + 1)$$

$$\Rightarrow M_2 = \frac{0.08}{5} = 0.016$$

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4. Low concentration of oxygen in the blood and tissues of people living at high altitude is due to \_\_\_\_\_. [NCERT Exemplar]

- (a) low temperature
- (b) low atmospheric pressure
- (c) high atmospheric pressure
- (d) both low temperature and high atmospheric pressure

**Answer/Explanation**

Answer: b

Explanation:

(b) Low atmospheric pressure will lead to low concentration of oxygen blood.

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5. Considering the formation, breaking and strength of hydrogen bond, predict which of the following mixtures will show a positive deviation from Raoult's law?

[NCERT Exemplar]

- (a) Methanol and acetone.
- (b) Chloroform and acetone.
- (c) Nitric acid and water.
- (d) Phenol and aniline.

**Answer/Explanation**

Answer: a

Explanation:

(a)  $\text{CH}_3\text{OH}$  and acetone, on mixing force of attraction will decrease.

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6. Which of the following aqueous solutions should have the highest boiling point?

[NCERT Exemplar]

- (a) 1.0 M NaOH
- (b) 1.0 M  $\text{Na}_2\text{SO}_4$
- (c) 1.0 M  $\text{NH}_4\text{NO}_3$
- (d) 1.0 M  $\text{KNO}_3$

**Answer/Explanation**

Answer: b

Explanation:

(b) Because  $i = 3$ ,  $\Delta T_b \propto i$ , Boiling point  $\propto \Delta T_b$ .

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7. In comparison to a 0.01 M solution of glucose, the depression in freezing point of a 0.01 M  $\text{MgCl}_2$  solution is \_\_\_\_\_. [NCERT Exemplar]

- (a) the same

- (b) about twice
- (c) about three times
- (d) about six times

**Answer/Explanation**

Answer: c

Explanation:

(c) It will be nearly 3 times because number of particles in  $\text{MgCl}_2 \rightarrow \text{Mg}^{2+} + 2\text{Cl}^-$  are thrice than glucose.

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8. An unripe mango placed in a concentrated salt solution to prepare pickle, shrivels because \_\_\_\_\_. [NCERT Exemplar]

- (a) it gains water due to osmosis.
- (b) it loses water due to reverse osmosis.
- (c) it gains water due to reverse osmosis.
- (d) it loses water due to osmosis.

**Answer/Explanation**

Answer: b

Explanation:

(d) Concentrated salt solution is hypertonic solution, therefore, fluids inside mango will come out and it shrivels.

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9. Which of the following statements is false? [NCERT Exemplar]

- (a) Two different solutions of sucrose of same molality prepared in different solvents will have the same depression in freezing point.
- (b) The osmotic pressure of a solution is given by the equation  $\pi = CRT$  (where C is the molarity of the solution).
- (c) Decreasing order of osmotic pressure for 0.01 M aqueous solutions of barium chloride, potassium chloride, acetic acid and sucrose is  $\text{BaCl}_2 > \text{KCl} > \text{CH}_3\text{COOH} > \text{sucrose}$ .
- (d) According to Raoult's law, the vapour pressure exerted by a volatile component of a solution is directly proportional to its mole fraction in the solution.

**Answer/Explanation**

Answer:

Explanation:

(a) is false because  $\Delta T_f$  will depend upon nature of solvent and their  $K_f$ .

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10. The value of Henry's constant  $K_H$  is \_\_\_\_\_. [NCERT Exemplar]

- (a) greater for gases with higher solubility.

- (b) greater for gases with lower solubility.
- (c) constant for all gases.
- (d) not related to the solubility of gases.

**Answer/Explanation**

Answer:

Explanation:

- (b) Higher the value of  $K_H$ , lower will be solubility.