

Self Assessment B

Question 1

The most significant force between solute particles in an aqueous MgCl_2 solution is

- A) charge-charge interaction
- B) charge-dipole interaction
- C) van der Waals interaction
- D) hydrogen bonding

Question 2

Which of the following liquids would make a good solvent for bromine, Br_2 ?

- A) $\text{HCl}(\text{g})$
- B) $\text{H}_2\text{O}(\text{l})$
- C) $\text{CS}_2(\text{l})$
- D) $\text{NH}_3(\text{g})$
- E) $\text{CH}_3\text{OH}(\text{l})$

Question 3

What is the sulfate ion concentration in a 12 M aqueous solution of $\text{Mn}(\text{SO}_4)_2$?

- A) 12 M
- B) 24 M
- C) 36 M
- D) 48 M
- E) None of the above.

Question 4

Calculate the molar concentration of a sulfuric acid solution containing 23.0% by mass of H_2SO_4 . The solution density is 1.398 g/cm^3 .

- A) 5.96 M
- B) 0.328 M
- C) 0.596 M
- D) 3.28 M
- E) None of the above.

Question 5

The molality of a solution of ethyl alcohol, $(\text{C}_2\text{H}_5\text{OH})$ in water is 0.960 mol/kg . How many grams of alcohol are

dissolved in 5.98 kg of water?

- A) 5.74 g
- B) 287 g
- C) 74.1 g
- D) 265 g
- E) 740 g

Question 6

What change would you predict in the solubility of $N_2(g)$ in water if the temperature changes from $20\text{ }^\circ\text{C}$ to $80\text{ }^\circ\text{C}$?

- A) Less N_2 would dissolve.
- B) More N_2 would dissolve.
- C) The solubility of N_2 would not change
- D) Some specific information about N_2 would have to be given before its solubility characteristics can be determined.

Question 7

The freezing point of pure camphor is $178.4\text{ }^\circ\text{C}$, and its molal freezing-point constant, K_f , is $40.0\text{ }^\circ\text{C}/m$. Find the freezing point of a solution containing 3.00 g of a compound (molar mass = 125 g/mol) dissolved in 45.0 g of camphor.

- A) $174.1\text{ }^\circ\text{C}$
- B) $157\text{ }^\circ\text{C}$
- C) $135.2\text{ }^\circ\text{C}$
- D) $140\text{ }^\circ\text{C}$
- E) $21.3\text{ }^\circ\text{C}$

Question 8

The osmotic pressure of a 0.82 M HCl solution is 35.9 atm at $18\text{ }^\circ\text{C}$. Calculate the van't Hoff factor for HCl at this concentration.

- A) 1.8
- B) 17.2
- C) 1.5
- D) 2.00

Question 9

Colloidal particles are _____ solute molecules.

- A) larger than
- B) smaller than
- C) the same size as
- D) either smaller than or larger than

Question 10

Which of the following is not an example of a hydrophilic group that can be attached to the surface of a large molecule?

- A) $-\text{COO}^-$
 - B) $-\text{OH}$
 - C) $-\text{NH}_3^+$
 - D) $-\text{CH}_3$
 - E) $-\text{NH}_2$
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