Self Assessment B

Question 1

The most significant force between solute particles in an aqueous MgCl₂ 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, Br₂?

- (C) A) HCl(g)
- **B**) H₂O(1)
- C) CS₂(l)
- **D**) NH₃(g)
- E) CH₃OH(l)

Question 3

What is the sulfate ion concentration in a 12 M aqueous solution of Mn(SO₄) 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/cm³.

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

Question 5

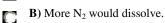
The molality of a solution of ethyl alcohol, (C₂H₅OH) in water is 0.960 mol/kg. How many grams of alcohol are

dissolved in 5.98 kg of water?

- **A**) 5.74 g
- **B**) 287 g
- **C**) 74.1 g
- **D**) 265 g
- **E 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 °C to 80 °C? A) Less N_2 would dissolve.



C) The solubility of N_2 would not change

D) Some specific information about N₂ would have to be given before its solubility characteristics can be determined.

Question 7

The freezing point of pure camphor is 178.4 $^{\circ}$ C, and its molal freezing-point constant, K_f, is 40.0 $^{\circ}$ 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 °C
- **B**) 157°C
- C) 135.2 °C
- **D**) 140°C
- **E**) 21.3 °C

Question 8

The osmotic pressure of a 0.82 M HCl solution is 35.9 atm at 18 $^{\circ}$ 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.

- **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) -COO⁻
 B) -OH
- **C C**) $-NH_3^+$
- **D**) -CH₃
- **E**) -NH₂