HW02 - Colligative Properties

Question 4	O mto
Question 1	2 pts
Some distilled water is added to an empty beaker. A gram of copper (II) nitrate is a to the beaker and while the water is being stirred. After a few minutes, what is in the beaker?	
opper ions, nitrate ions, and water	
nitrogen gas, copper atoms, electrons, and water	
solid copper (II), nitrate, and watersolid copper, nitrate ions, and water	
Question 2	2 pts
In which of the following pairs do both compounds have a van't Hoff factor (i) of 2	2?
O glucose and sodium chloride	
sodium sulfate and potassium chlorideperchloric acid and barium hydroxide	
o sodium chloride and magnesium sulfate	
Question 3	2 pts
For solutions of a non-electrolyte, the van't Hoff factor is:	
$egin{array}{lll} \bigcirc i &= 0 \ \hline \bigcirc i &= 3 \end{array}$	
$\bigcirc i = 1$	
$\bigcirc \ i = 2$	
Question 4	2 pts
How many moles of ions are contained in 1.27 L of a 1.75 M solution of $Mg(NO_3)_2$	
○ 6.67 mol	
○ 4.45 mol	
○ 2.22 mol○ 0.741 mol	
Question 5	2 pts
Theoretically, it should be harder to dissolve ($NaCI / Al_2S_3$) in water because the / lower) the charge density of a substance, the lower its solubility.	(higher
○ Al ₂ S ₃ , lower	
○ NaCl, lower	
○ Al₂S₃, higher○ NaCl, higher	
Question 6	3 pts
The freezing point of seawater is about -1.85°C. Assume that seawater is an aque	
solution of sodium chloride and then calculate the molality of NaCl in seawater. Th water is 1.86 K/m.	e K _f for
○ 0.995 m	
○ -0.497 m ○ 0.497 m	
○ 1.99 m	
Question 7	3 pts
What will be the freezing point of a solution of 8 moles of sodium dichromate (Na ₂ 0 dissolved in 16 kg of water? Use the following values:	Cr ₂ O ₇)
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dissolved in 16 kg of water? Use the following values: K ₀ = 0.512 K/m K _f = 1.86 K/m 272.2 K 28°C 270.2 K 275.8 K Question 8 Calculate the vapor pressure at 20°C of a solution containing 0.61g of naphthalend of chioroform (CHCl ₃), Naphthalene (C ₁₀ H ₃) has a low vapor pressure and may be assumed to be nonvolatile. The vapor pressure of chloroform at 20°C is 156 torr. 150.65 torr The vapor pressure would not change as naphthalene is considered non-volatile. 28.10 torr 20.90 torr Question 9 Rank the following aqueous solutions from lowest to highest boiling point: 0.5 m N m KGI, 0.5 m BaCl ₂ , and 1 m Ba(NO ₃) ₂ . All salt are dissolved in water. 1 m KGI < 1 m Ba(NO ₃) ₂ < 0.5 m NaCl < 0.5 m BaCl ₂ < 1 m KGI 0.5 m BaCl ₂ < 1 m KGI < 1 m Ba(NO ₃) ₂ < 0.5 m NaCl 0.5 m NaCl < 0.5 m BaCl ₂ < 1 m KGI < 1 m Ba(NO ₃) ₂ Question 10 A semi-permeable membrane can withstand an osmotic pressure of 0.75 atm. Wholating of aqueous magnesium bromide solution would reach the limit for this membrane? (Assume RT = 25 L-atm·mol ⁻¹) 0.01 m M 0.03 mM 0.03 mM 0.03 mM 0.03 mM 0.03 mM 0.03 msortion of the standard an osmotic pressure of 0.75 atm. Wholating of aqueous magnesium bromide solution would reach the limit for this membrane? (Assume RT = 25 L-atm·mol ⁻¹)	3 pts e in 16g 2 pts aCl, 1
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 \bigcirc There is no net flow of H_2O molecules from one solution to another.

Red blood cells contain Na^+ ions, K^+ ions, and water. If we place some red blood cells

2 pts

☐ There is a net flow of Cl⁻ ions from solution B to solution A.

into a beaker full of pure water, what will happen to them?

Question 13

 $\ \ \, \bigcap \ \, \text{nothing}$

O they will wiggle around rapidly

O they will swell and burst

they will shrivel and collapse