

Exam #8 (Chp 8) SOLUTIONS

(110 points total)

Mark answers on your scantron for Questions 1-27. Mark only one answer unless directed otherwise. Each question is worth 2 pt.

(8.1) A 5 gallon tank filled with methane (gas) and a small amount of methyl mercaptan gives a noticeable odor.

Use these answers for Questions 1 and 2. A) solvent B) solution C) solute D) water

1. Methyl mercaptan is the C in this mixture.

2. Methane is the A in this mixture.

3. (8.1) Mayonnaise, fog and milk are examples of this. C

A) solution

4. (8.1) Normal saline, Ringers and 5% glucose are examples of this. A

B) suspension

5. (8.1) This is a mixture like muddy water where the particles settle out over time. B

C) colloid

(8.2) Use these answers for Questions 3, and 6.

A) unsaturated

B) saturated

C) increase

D) decrease

E) stay the same

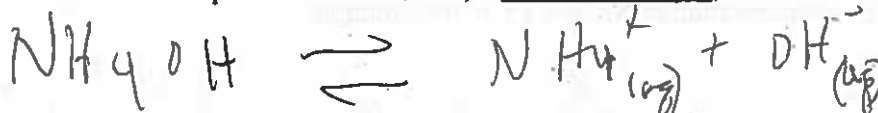
6. (8.2) A pinch of salt added to a pot of boiling water makes a A solution.

7. (8.2) If the temperature of a solution increases, the solubility of most solid solutes will C.

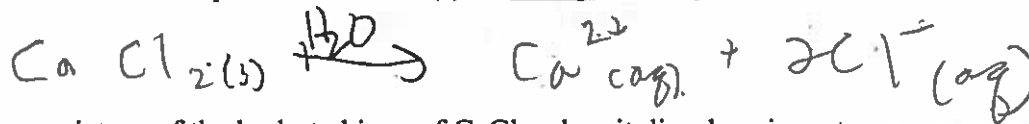
8. (8.2) If the pressure above a solution increases the solubility of a gaseous solute will C.

9. (8.2) When a bottle of soda is opened the solubility of the CO₂ Ds.

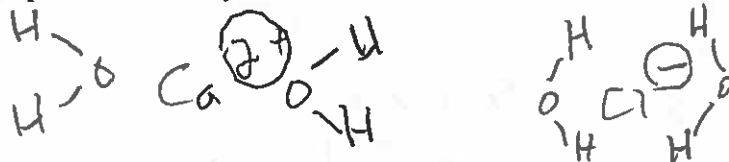
(8.3) (4 pt) Write the balanced equation for NH₄OH, a weak electrolyte, when it dissolves in water.



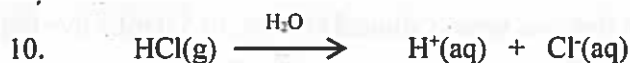
(8.3) (4 pt) Write a balanced equation for CaCl₂(s), a strong electrolyte, when it dissolves in water.



(8.3) (4 pt) Draw a picture of the hydrated ions of CaCl₂ when it dissolves in water.



(8.3) Select the answer on the right that corresponds to each of the following solubility equations.



A) Strong electrolyte



B) Weak electrolyte



C) Non-electrolyte

13. (8.3) In Question 12, the solute is A) totally ionic B) only molecular C) both ionic and molecular.

14. (8.3) Which cation and anion are present at the highest concentrations in blood (extracellular fluid)?

- Mark two.
 A) K^+ B) Na^+ C) Cl^- D) PO_4^{3-} E) HCO_3^-

15. (8.3) How many equivalents are there in a solution that contains 4.25 moles of Mg^{2+} ?

- A) 4.25 Eq B) 8.50 Eq C) 2.13 Eq D) 1.00 Eq

$$\times 2 \frac{Eq}{mol} = 8.5$$

Answer all of the following question using a 15% aqueous solution of NaCl

(8.4) (6 pt) How many grams of NaCl are present in 1.0 L of this solution?

$$15\% = \frac{15g}{100ml} \times \frac{1000ml}{1L} = 150g \text{ NaCl}$$

(8.4) (4 pt) How many moles of NaCl are there in 1.0 L of this solution?

The molar mass of NaCl is $22.99 + 35.45 = 58.44 \text{ g/mol}$

$$150g \text{ NaCl} \times \frac{1 \text{ mol}}{58.44g} = 2.6 \text{ mol NaCl}$$

(8.4) (4 pt) What is the molarity of NaCl in 1 L of this solution?

$$\frac{2.6 \text{ mol}}{1L} = 2.6 \frac{\text{mol}}{L}$$

(8.4) (8 pt) What is the Eq/L concentration of Na^+ and Cl^- in this solution.

$$\frac{2.6 \text{ mol}}{L} \times \frac{1 \text{ Eq}}{1 \text{ mol}} = 2.6 \frac{\text{Eq } Na^+}{L} / \frac{2.6 \text{ Eq } Cl^-}{L}$$

(8.5) (6 pt) What volume will 1 L of this solution have to be diluted to in order to make a 0.90% aqueous solution of NaCl?

$$M_1 V_1 = M_2 V_2 \text{ or } C_1 V_1 = C_2 V_2$$

$$15\% (1L) = 0.9\% (xL)$$

$$15(1) / 0.9 = 17L$$

(8.5) (6 pt) What is the final % concentration of NaCl in a solution that was serially diluted (1.0 mL to 5.0 mL) five times?

$$C_f = C_i \left(\frac{1}{2}\right)^n = 15\% \left(\frac{1}{5}\right)^5 = 4.8 \times 10^{-3} \%$$

$$= 0.0048\%$$

(8.4) (6 pt) What is the ppm concentration of glucose that is 112 mg glucose/dL blood?

$$\text{ppm} = \frac{\text{g}}{\text{mL}} \times 10^6$$

$$\frac{112 \text{ mg}}{1 \text{ dL}} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{.001 \text{ dL}}{.1 \text{ mL}} \times 10^6 = \frac{112}{100} \times 10^6 = 1120000 = 1120 \text{ ppm}$$

16. (8.4) What is the molar mass of calcium chloride?

- A) 75.53 B) 47.46 C) 82.91 D) 110.98 CaCl_2

17. (8.4) What is the mass of 3.61 moles of Ca?

- A) 0.090 g B) 144 g C) 40.0 g D) 150 g

(8.4) (10 pt) A child weighs 75 lb. The dose of drug C is specified as 25 mg/kg/24 hr in three doses. The drug is administered as an injection of a 50.0 mg drug C/mL solution. How many mL of drug should be administered in each dose. (2.2 lb = 1 kg)

$$? \text{ mL} = 75 \text{ lb child} \times \frac{1 \text{ kg}}{2.2 \text{ lb}} = 34 \text{ kg}$$

$$34 \text{ kg} \times \frac{25 \text{ mg drug}}{1 \text{ kg} \cdot 24 \text{ hr}} = \frac{850 \text{ mg drug}}{24 \text{ hr}}$$

$$\frac{850 \text{ mg drug}}{24 \text{ hr}} \times \frac{1 \text{ mL}}{50.0 \text{ mg drug}} = \frac{17 \text{ mL}}{24 \text{ hr}} \times \frac{24 \text{ hr}}{3 \text{ doses}} = \frac{5.7 \text{ mL}}{\text{dose}}$$

<p>18. In the "naked egg" experiment the tap water was <u>hypo</u> <u>C</u> to the egg.</p>	<p>A) into</p>	<p>AC) diffusion</p>
<p>19. A red blood cell in 0.9% NaCl will <u>iso</u> <u>C</u> <u>BC</u></p>	<p>B) out of</p>	<p>AD) crenate</p>
<p>20. As the blood of a patient undergoing hemodialysis leaves the patient, its solute concentration is <u>hypo</u> <u>D</u> or <u>BD</u> to the dialyzing solution.</p>	<p>C) hypotonic</p>	<p>AE) swell</p>
<p>21. As the blood of a patient undergoing hemodialysis <u>re-enters</u> the patient, its <u>osmotic</u> pressure is <u>CD</u> than the dialyzing solution.</p>	<p>D) hypertonic</p>	<p>BC) neither crenate or swell</p>
<p>22. The word for water movement across a semipermeable membrane is <u>AB</u></p>	<p>E) isotonic</p>	<p>BD) higher</p>
<p>23. In the naked egg experiment the water moved <u>B</u> the egg that was in the <u>Karo</u> syrup.</p>	<p>AB) osmosis</p>	<p>BE) lower CD) the same as</p>

Use these answers for Questions 24 to 27.

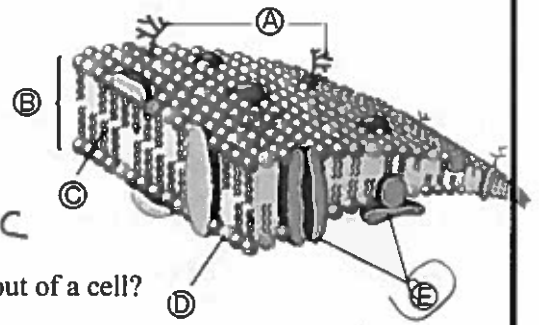
A) passive B) facilitated C) active D) exocytosis E) endocytosis

24. In this diagram of a cell membrane B | C transport occurs in region E (mark two answers)

25. A transport occurs in region C of the membrane.

26. What kind of transport occurs with the movement of H^+ (energy required) C

27. Which transport process occurs when proteins are transported by vesicles out of a cell? D



8 pt

SCRATCH

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