Remote Learning Packet

NB: Please keep all work produced this week. Details regarding how to turn in this work will be forthcoming.

March 30 - April 3, 2020

Course: 10 Chemistry

Teacher(s): Ms. Oostindie megan.oostindie@greatheartsirving.org

Weekly Plan:

Monday, March 30

☐ Read and record notes for sections 9.9-9.10 (pp. 275-277).

☐ Answer questions: p. 290 #74-75.

Tuesday, March 31

☐ Read and record notes for section 9.11 (pp. 278-282).

Wednesday, April 1

☐ Read and record notes for section 9.12 (pp. 282-284).

Thursday, April 2

☐ Complete and grade practice problems: p. 290 #76, 78, 80.

Friday, April 3

☐ Complete and grade practice problems: p. 290 #86, 88, 90.

Statement of Academic Honesty

I affirm that the work completed from the packet is mine and that I completed it independently.

I affirm that, to the best of my knowledge, my child completed this work independently.

_____

Student Signature

_____

Parent Signature

Monday, March 30

Read sections 9.9-9.10 (pp. 275-277). Take notes of the key vocabulary terms and their definitions as well as any diagrams, equations, and worked examples. Do not answer the questions in yellow boxes. Notes can be taken in a notebook or on separate paper.

Answer questions: p. 290 #74-75. Answers should be provided in complete sentences on a separate piece of paper from notes.

Tuesday, March 31

Read section 9.11 (pp. 278-282). Take notes of the key vocabulary terms and their definitions as well as any diagrams, equations, and worked examples. Do not answer the questions in yellow boxes. Continue notes on paper used yesterday.

Wednesday, April 1

Read section 9.12 (pp. 282-284). Take notes of the key vocabulary terms and their definitions as well as any diagrams, equations, and worked examples. Do not answer the questions in yellow boxes. Continue notes on paper used Monday and Tuesday.

Thursday, April 2

Complete practice problems: p. 290 #76, 78, 80. Show all work, box your final answer, use the correct units, and the correct number of significant figures. Work should be on a separate piece of paper from notes.

After you have attempted each question, refer to the attached answer key and correct your work in a different color pen.

Friday, April 3

Complete practice problems: p. 290 #86, 88, 90. Show all work, box your final answer, use the correct units, and the correct number of significant figures. Work should be on a separate piece of paper from notes.

After you have attempted each question, refer to the attached answer key and correct your work in a different color pen.

Pages to be turned in from this week are underlined.

p. 290 # 76, 78, 80

76. What does it mean when we say that the concentration of Ca^{2+} in the blood is 3.0 mEq/L?

$$\frac{3.0\ mEq}{L}\left(\frac{20.04\ mg}{mEq}\right)\left(\frac{g}{1000\ mg}\right)\left(\frac{mol}{40.078\ g}\right) = \boxed{0.0015\ \frac{mol}{L}}$$

concentration of Ca^{2+}

78. Kaochlor, a 10% (w/v) KCl solution, is an oral electrolyte supplement administered for potassium deficiency. How many milliequivalents of K^+ are in a 30 mL dose?

① $10\% = \frac{x}{30\ mL} \times 100\%$ ← grams of KCl

$x = 3\ g\ KCl$

② $3\ g\ KCl\left(\frac{mol}{74.491\ g}\right)\left(\frac{1\ mol\ K^+}{1\ mol\ KCl}\right)\left(\frac{39.098\ g}{mol}\right) = 1.57\ g\ K^+$

③ $1.57\ g\left(\frac{1000\ mg}{g}\right)\left(\frac{mEq}{39.098\ mg}\right) = \boxed{40\ mEq}$

80. Look up the concentration of Cl^- ion in the blood in Table 9.6. How many milliliters of blood would be needed to obtain 1.0 g of Cl^- ions?

98 - 106 mEq/L of Cl^- in blood

$$1.0\ g\ Cl^-\left(\frac{1000\ mg}{g}\right)\left(\frac{mEq}{35.453\ mg}\right)\left(\frac{L}{98\ mEq}\right)\left(\frac{1000\ mL}{L}\right) = \boxed{\begin{matrix}280\\ \cancel{287.82}\ mL\end{matrix}}$$

p. 290 # 86, 88, 90

86. Why do red blood cells swell up and burst when placed in pure water?

The concentration of water inside the cells is lower than the concentration of water outside the cells. Water diffuses into the cells until the volume cannot be contained by the cell membrane and the cell bursts.

88. Which of the following solutions has the higher osmolarity?

a) 0.25 M KBr or **0.20 M Na_2SO_4**

osmolarity (osmol) = # of moles of dissolved particles / L solution

$$\frac{0.25\ \cancel{mol\ KBr}}{L}\left(\frac{2\ mol\ particles}{\cancel{mol\ KBr}}\right) = 0.5\ osmol$$

KBr → K^+ + Br^-

$$\frac{0.20\ mol\ Na_2SO_4}{L}\left(\frac{3\ mol\ particles}{mol\ Na_2SO_4}\right) = 0.6\ osmol$$

Na_2SO_4 → Na^+ + Na^+ + SO_4^{2-}

b) 0.30 M NaOH or **3.0% (w/v) NaOH**

$$0.30\ M\ NaOH\left(\frac{2\ mol\ particles}{mol\ NaOH}\right) = 0.60\ osmol$$

$$3.0\% = \frac{x}{1000\ mL} \times 100\%$$

$x = 30\ g\ NaOH$ (in 1 L)

$$\frac{30\ g\ NaOH}{L}\left(\frac{mol}{39.99\ g}\right)\left(\frac{2\ mol\ particles}{mol\ NaOH}\right) = 1.5\ osmol$$

90. A pickling solution is prepared by dissolving 270 g of NaCl in 3.8 L of water. Calculate the osmolarity of the solution.

$$\frac{270\ g\ NaCl}{3.8\ L}\left(\frac{mol\ NaCl}{58.443\ g}\right) = 1.21576\ \frac{mol}{L}\left(\frac{2\ mol\ particles}{mol\ NaCl}\right) = \boxed{\begin{matrix}2.4\\ \cancel{2.432}\ osmol\end{matrix}}$$