

SHS AP Chemistry 2019-2020

Summer Assignment

Mrs. Laurie Vaughn-Grantges Class Website: www.molelady.com

Welcome to AP Chemistry at SHS!

Below is a chemistry review to get you back into the "mole groove" for your upcoming adventure in AP Chemistry! Your mission: Pass the AP Chem Exam and start on your quest for a 5 in May and retain as much as possible for your university debut. It is vital that you review these basic chemistry concepts, so you can attack more challenging topics. Good luck and let me know how you are doing.

Intro to AP Chemistry: This document gives you information about the exam and about the course. Make sure to follow this [link](#) at the top of this document to the AP Chem College Board website.

Assignment: Answer the following questions in a notebook or on loose leaf paper. For math problems, show all work and report answers to significant figures.

This assignment is on: **First day of school -August 14th

Part I. Science Skills

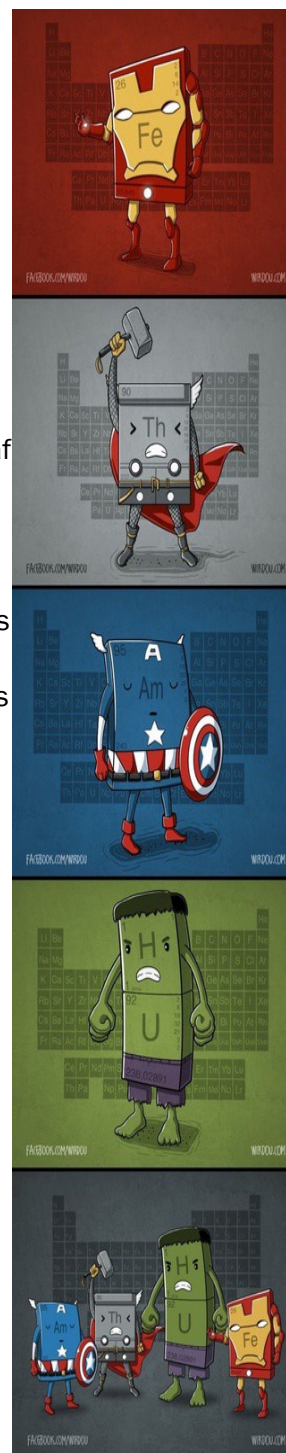
- 1) What is the difference between quantitative and qualitative data? Give examples of each.
- 2) What is the difference between an observation and an inference? Give examples of each.
- 3) What are the differences between a chemical and a physical change?
- 4) Identify the following as a chemical or a physical change.
 - a) melting ice
 - b) pennies turning green when an acid is added to them
 - c) hydrogen gas ignites in air when a spark is added to it
 - d) making water vapor (gas) from liquid water
 - e) making water vapor (gas) from hydrogen and oxygen mixing together
 - f) hydrochloric acid evaporating to hydrochloric acid gas
- 5) How many significant figures are in your answer?
 - a. 0.000983 has _____ sig figs & rounded to 1 sig figs is _____.
 - b. 12,700.00 has _____ sig figs & rounded to 2 sig figs is _____.

Example:

$$6.0 \times 3.00 = 18 \quad \text{The answer should be } \underline{18.00}$$

Correct the following answers using sig figs.

- a. $56.00 - 35.0 = 21$ The answer should be _____
- b. $3.24 \times 5.63 = 18.2412$ The answer should be _____
- c. $(2.355 + 2.645) \times 10.00 = 50$ The answer should be _____
- d. $654 \sqrt{32} = 20.4375$ The answer should be _____
- e. $3.0 \times 10^4 \times 6.02 \times 10^{23} = 1.8 \times 10^{27}$ The answer should be _____



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- 6) What are the fundamental/base SI units and what do they measure?
- 7) Use dimensional analysis to solve for the following conversions.
- Your book snuck into the lab to play with lab equipment. It massed itself and found it has a mass of 0.6321 kilogram (Kg). What is its mass in grams (g)?
 - How many kilobytes (Kb) of data are in an older 512 megabyte (Mb) flash drive?
 - You decided to buy a 2.0 L bottle of Mountain Dew Code Red for a potluck in science. How many milliliters (mL) is contained in the bottle?
 - There's a person trying to beat the world record of taking 1449 selfies per hour. How many selfies per second is that current world record??
 - You need to take care of Ms. Cox's biology students' plants, so you bought a 2.20×10^5 g bag of fertilizer. How many kilograms of fertilizer is that?
 - How many donuts could your chemistry instructor buy for the science department with twenty-three dollars if they cost \$4.00/dozen? Tax and other fees are included in the price.

Answer the following questions about density ($D=m/v$)

- Giannis Antetokounmpo and other NBA players typically play with a basketball having a diameter of 24.12 cm and a mass of 624 g. What is the density of the basketball?
- The density of aluminum is 2.70 g/mL. If the mass of a sheet of aluminum found in the lab is 244 grams, what is the volume of the aluminum?

The following equation shows how to convert between temperature units:

$$K = ^\circ C + 273$$

- How many $^\circ C$ is 372 Kelvin? Show your work.

Part II. Basic Chemistry

- 8) Locate the following groups of elements on the periodic table. Which group are they in?
- | | |
|----------------------------------|----------------|
| a) alkali metals | d) halogens |
| b) alkaline earth metals | e) metalloids |
| c) inner/outer transition metals | f) noble gases |
- 9) What do you remember about the following? Draw an example of any atom and label using the letters of the following atom terms. a) atomic mass, b) mass number, c) isotope, d) mass number, e) protons, f) electrons, g) neutrons, and h) ions.
- 10) Make a table for each atom or ion including: number of protons, electrons, neutrons, mass number, and name.
- | | | | | |
|--------------|--------------|--------------|-------|--------------|
| a) Fe^{+3} | b) Mg^{2+} | c) Cl^{-1} | d) Ar | e) Li^{+1} |
|--------------|--------------|--------------|-------|--------------|
- 11) Define and give an example of an ionic compound. (something else besides NaCl)

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- 12) Define what a diatomic element is and list the 7 diatomic elements.
- 13) Name the following substances. Put a star by each ionic compound.
- | | | |
|--------|----------------------------|----------------------------|
| a) W | d) MgCl_2 | g) MnCO_3 |
| b) Mn | e) H_2SO_4 | h) SO_3 |
| c) HCl | f) H_2SO_3 | i) Fe_2S_3 |
- 14) Write the chemical symbols/formula for the following substances.
- | | |
|------------------------|---------------------|
| a) Silver | f) Lithium sulfide |
| b) Hydrobromic acid | g) Nitrous acid |
| c) Iron (III) chloride | h) Carbon monoxide |
| d) Magnesium carbonate | i) Ammonium sulfite |
| e) Phosphoric acid | j) Sulfur trioxide |
- 15) What are the similarities and difference between SO_3 and SO_3^{2-} ?

Part III. Chemical Reactions

- 16) What are the common symbols used in chemical equations?
- 17) Translate the following equations into balanced chemical equations.
- When aqueous barium chloride reacts with aqueous silver nitrate, aqueous barium nitrate and silver chloride powder are made.
 - When dissolved sodium hydroxide reacts with sulfuric acid, aqueous sodium sulfate and water are formed.
 - When fluorine gas is put into contact with calcium metal at high temperatures, calcium fluoride powder is created.
 - When sodium metal reacts with iron (II) chloride, iron metal, and aqueous sodium chloride are formed.
 - A solution of hydrochloric acid reacts with solid calcium bicarbonate to produce water, carbon dioxide gas, and aqueous calcium chloride.

For reference: You Tube Video Notes Links

The following list of links are to help you with the summer assignment questions, should you need it.

- Solving DA problems https://youtu.be/qT4_i7ZZvn4
- Scientific Notation Review <https://youtu.be/VjFUS8hBjxU>
- Sig Figs <https://youtu.be/66DJiUj2Flo>
- Sig Fig Example with calculations https://youtu.be/_Bca4ceuR7o
- Matter/Physical and Chemical <https://youtu.be/9QH94rx9d5M>
- Nomenclature (Writing the Chemistry language): <http://www.fernbank.edu/Chemistry/nomen.html>
- Chemical Equation writing: <https://www.youtube.com/watch?v=OzC6v5gU0k4>