AP Chemistry Summer Assignment

Welcome to advanced chemistry! While I want you to enjoy your summer, I am giving you some chemistry review to complete over the summer. Nothing too complicated, just basic things from Chemistry I that we won't be reviewing in advanced chemistry.

You may use your textbook/online resources to help you with this work!

If you have questions, you may e-mail me. I will be on periodically throughout the summer.

Mrs. Paxton

1. Does each of the following describe a physical change or a chemical change?

    a. The helium gas inside a balloon tends to leak out after a few hours.

    b. A flashlight beam slowly gets dimmer and finally goes out.

    c. Frozen orange juice is reconstituted by adding water to it.

    d. The growth of plants depends on the sun's energy in a process called photosynthesis.

    e. A spoonful of table salt dissolves in a bowl of soup

2. Indicate the number of protons, neutrons, and electrons in each of the following species:

    a. $^{15}_{7}N$

    b. $^{33}_{16}S$

    c. $^{63}_{29}Cu$

    d. $^{84}_{38}Sr$

    e. $^{130}_{56}Ba$

    f. $^{186}_{74}W$

    g. $^{202}_{80}Hg$

3. Calculate the molar masses of the following:

a. KClO b. Ag_2CO_3 c. HNO_2 d. $KMnO_4$ e. $CsClO_3$ f. $Fe_2(C_2O_4)_3$ g. Fe_2O_3

4. How many moles of cobalt (Co) atoms are there in 6.00×10^9 cobalt atoms?

5. How many moles of calcium (Ca) atoms are in 77.4 g of calcium?

6. How many atoms are present in 3.14 g of copper (Cu)?

7. Water has a molar weight of 18 grams/mol. You drink a 2-liter bottle of water every day, and you are such a smarty that you know that 1-ml of H_2O weighs 1 g. Can you tell me how many moles of water you consume a day?

8. Aspartame is an artificial sweetener that is 160 times sweeter than sucrose (table sugar) when dissolved in water. It is marketed by G.D. Searle as *Nutra Sweet*. The molecular formula of aspartame is $C_{14}H_{18}N_2O_5$.

a) Calculate the gram-formula-mass (molar mass) of aspartame

b) How many moles of molecules are in 10 g of aspartame?

c) What is the mass in grams of 1.56 moles of aspartame?

d) How many molecules are in 5 **mg** of aspartame?

e) How many atoms of nitrogen are in 1.2 grams of aspartame?

9. Balance the following equations:

a. $C + O_2 \rightarrow CO$

b. $CO + O_2 \rightarrow CO_2$

c. $H_2 + Br_2 \rightarrow HBr$

d. $K + H_2O \rightarrow KOH + H_2$

e. $Mg + O_2 \rightarrow MgO$

f. $O_3 \rightarrow O_2$