

AP Chemistry Summer Assignment

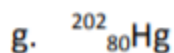
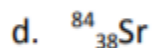
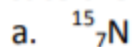
Welcome to advanced chemistry! While I want you to enjoy your summer, I am giving you some chemistry review to complete over the summer. Nothing too complicated, just basic things from Chemistry I that we won't be reviewing in advanced chemistry.

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:



3. Calculate the molar masses of the following:



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 $\text{C}_{14}\text{H}_{18}\text{N}_2\text{O}_5$.
 - 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. $\text{C} + \text{O}_2 \rightarrow \text{CO}$
- b. $\text{CO} + \text{O}_2 \rightarrow \text{CO}_2$
- c. $\text{H}_2 + \text{Br}_2 \rightarrow \text{HBr}$
- d. $\text{K} + \text{H}_2\text{O} \rightarrow \text{KOH} + \text{H}_2$
- e. $\text{Mg} + \text{O}_2 \rightarrow \text{MgO}$
- f. $\text{O}_3 \rightarrow \text{O}_2$