

Chemistry Module 3 Homework

Assignment #1: Write answers on notebook paper. Show calculations.

Read to page 81.

1. Write the Law of Mass Conservation.
2. List the four assumptions of Dalton's atomic theory.
3. List three characteristics of metals.
4. List three characteristics of nonmetals.
5. What is a metalloid?
6. Classify each element as a metal, nonmetal or metalloid.
 - a. aluminum
 - b. silver
 - c. silicon
 - d. helium
 - e. zinc
7. What is the group number of each element in the previous problem? Use the A/B system.
8. A chemist decomposes 195.0 g water and makes 21.7 g of hydrogen gas. How much oxygen must have been produced?
9. A substance was decomposed into 9.0 g of hydrogen gas, 36.0 g of carbon and 42.0 g of nitrogen gas. What was the mass of the compound before it was decomposed?
10. A chemist mixes 120.0 g of calcium with 120.0 g of chlorine and makes 187.5 g of calcium chloride with some leftover calcium.
 - a. How much calcium was left over?
 - b. How much calcium and chlorine should be used to make exactly 187.5 g of calcium chloride with no leftover reactants?
 - c. How much calcium and chlorine should be used to make 800.0 g of calcium chloride without any leftovers?
11. A student preparing some aluminum sulfide mixes 81.0 g of aluminum with 160.0 g of sulfur. This produces 150.3 g of aluminum sulfide plus some extra sulfur.
 - a. How much sulfur was left over?
 - b. How much aluminum and sulfur should be used to make exactly 150.3 g of aluminum sulfide without left over reactants?
 - c. How much of each chemical is needed to make 500.0 g of aluminum sulfide without leftovers?
12. What is the chemical formula of a molecule made up of 2 hydrogen atoms, 1 sulfur atom and 4 oxygen atoms?
13. How many atoms are in one molecule of $\text{C}_{12}\text{H}_{24}\text{O}_{10}\text{S}_2$?

14. Watch the videos at www.periodicvideos.com of two elements and write one or two sentences about the properties of each element you watched.

15. Honors - For each element, list:

- a. its chemical symbol
- b. its state (solid, liquid, gas) at room temperature
- c. describe its appearance (color, texture, odor, etc.)
 - 1. Carbon
 - 2. Chlorine
 - 3. Hydrogen
 - 4. Iron
 - 5. Mercury
 - 6. Oxygen
 - 7. Phosphorous
 - 8. Sodium
 - 9. Sulfur
 - 10. Zinc

16. How can you tell if a compound is ionic or covalent by looking at its chemical formula?

17. Which compound will conduct electricity if it is dissolved in water: ionic or covalent?

18. Determine whether each compound is ionic or covalent:

- a. CO
- b. KBr
- c. CaF_2
- d. C_3H_8
- e. Li_2O
- f. SO_3
- g. AlCl_3
- h. Na_3N

19. Name each compound in the previous question.

- | | |
|----|----|
| a. | e. |
| b. | f. |
| c. | g. |
| d. | h. |

20. What are the chemical formulas for:

- a. nitrogen monoxide
- b. triphosphorous tetrahydride
- c. dinitrogen pentahydride
- d. trisulfur hexafluoride

21. Honors – Find the chemical formula for these compounds:

- a. Acetone
- b. Octane
- c. Laughing gas
- d. Baking soda
- e. Acetic acid
- f. Sucrose (sugar)