

Chemistry Module 3 Homework

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

Read to page 81.

- Write the Law of Mass Conservation.
Matter cannot be created or destroyed. It can only change forms.
- List the four assumptions of Dalton's atomic theory.
Everything is made up of atoms.
Atoms of the same element have the same properties.
Atoms of different elements have different properties.
Compounds are formed when atoms join together in whole number ratios.
- List three characteristics of metals.
Shiny, ductile, malleable, conduct electricity & heat
- List three characteristics of nonmetals.
Most are gasses. Solid nonmetals are dull, brittle, not good conductors
- What is a metalloid?
An element that has properties in between those of a metal and a nonmetal
- Classify each element as a metal, nonmetal or metalloid.
 - aluminum **metal**
 - silver **metal**
 - silicon **metalloid**
 - helium **nonmetal**
 - zinc **metal**
- What is the group number of each element in the previous problem? Use the A/B system.
 - 3A**
 - 1B**
 - 4A**
 - 8A**
 - 2B**
- A chemist decomposes 150.0 g water and makes 16.7 g of hydrogen gas. How much oxygen must have been produced?
133.3 grams
- A substance was decomposed into 3.0 g of hydrogen gas, 12.0 g of carbon and 14.0 g of nitrogen gas. What was the mass of the compound before it was decomposed?
29 grams
- A chemist mixes 100.0 g of calcium with 100.0 g of chlorine and makes 156.5 g of calcium chloride with some leftover calcium.
 - How much calcium was left over? **43.5 grams**
 - How much calcium and chlorine should be used to make exactly 156.5 g of calcium chloride with no leftover reactants? **56.5 grams calcium, 100.0 grams chlorine**
 - How much calcium and chlorine should be used to make 1.0 kg of calcium chloride without any leftovers? **361 grams calcium, 639 grams chlorine**
- A student preparing some aluminum sulfide mixes 54.0 g of aluminum with 100.0 g of sulfur. This produces 150.3 g of aluminum sulfide plus some extra sulfur.
 - How much sulfur was left over? **3.7 grams**
 - How much aluminum and sulfur should be used to make exactly 150.3 g of aluminum sulfide without left over reactants? **54.0 grams aluminum, 96.3 sulfur**
 - How much of each chemical is needed to make 200.0 g of aluminum sulfide without leftovers? **71.9 g aluminum, 128.1 g sulfur**
- What is the chemical formula of a molecule made up of 2 hydrogen atoms, 1 sulfur atom and 4 oxygen atoms? **H₂SO₄**
- How many atoms are in one molecule of C₁₂H₂₄O₁₀S₂? **48 atoms**

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?

If it contains a metal, it's ionic.

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

Ionic

18. Determine whether each compound is ionic or covalent:

- | | |
|---------------------------|----------|
| a. AlF_3 | ionic |
| b. C_2H_6 | covalent |
| c. CO | covalent |
| d. K_2O | ionic |
| e. LiCl | ionic |
| f. MgCl_2 | ionic |
| g. Na_3N | ionic |
| h. S_2O_3 | covalent |

19. Name each compound in the previous question.

- | | |
|-------------------------|-----------------------|
| a. aluminum fluoride | e. lithium chloride |
| b. dicarbon hexahydride | f. magnesium chloride |
| c. carbon monoxide | g. sodium nitride |
| d. potassium oxide | h. disulfur trioxide |

20. What are the chemical formulas for:

- | | |
|---------------------------------|------------------------|
| a. nitrogen dioxide | NO_2 |
| b. tetraphosphorous hexahydride | P_4H_6 |
| c. disulfur tetrahydride | S_2H_4 |
| d. trinitrogetn pentafluoride | N_3F_5 |

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

- Lye
- Laughing gas
- Baking soda
- Muriatic acid
- Sulfuric acid

