

Writing Equations from Words

Name _____ Per _____

Writing chemical equations is important in chemistry. We must be able to verbally read an equation using proper names and nomenclature as well as write a chemical equation from words. Below is a summary of hints to help you write chemical equations from words.

- Reactants \rightarrow products: chemical reactants are what you start with and products are what you form. You can have single or multiple products or reactants.
- \rightarrow the "arrow" means forms or yields. The arrow separates the reactants from the products.
- If you know the state of matter, you should include it in the formula. $\text{H}_2\text{O}_{(s)}$, $\text{H}_2\text{O}_{(l)}$, and $\text{H}_2\text{O}_{(g)}$ represent solid, liquid, and gaseous H_2O . You can also represent a substance that is dissolved in water; also known as an *aqueous solution*. $\text{NaCl}_{(s)}$ represents solid sodium chloride and $\text{NaCl}_{(aq)}$ represents sodium chloride that has been dissolved in water. Acids are always aqueous solutions. You can tell state of matter for elements by their letter code on the PT. At room temperature, black letters are solids, blue letters are liquids, and red letters are gases.
- Lastly, there are 7 diatomic elements that always form a bond with themselves when they are alone in an equation. H, N, O, F, Cl, Br, I all become H_2 , N_2 , O_2 , F_2 , Cl_2 , Br_2 , I_2 when they are alone in a compound.

Write the following word equations using symbols.

1. Hydrogen + nitrogen monoxide yields water + nitrogen.
2. Hydrogen + oxygen yields water.
3. Zinc + lead (II) nitrate yields zinc (II) nitrate plus lead.
4. Aluminum bromide + chlorine yields aluminum chloride+ bromine.
5. Sodium phosphate + calcium chloride yields calcium phosphate + sodium chloride.

6. Potassium chlorate, when heated, yields potassium chloride + oxygen gas.

7. Aluminum + hydrochloric acid yields aluminum chloride + hydrogen gas.

8. Calcium hydroxide + phosphoric acid yields calcium phosphate + water.

9. Copper + sulfuric acid yields copper (II) sulfate + water + sulfur dioxide.

10. Nitrogen + hydrogen yields nitrogen trihydride (AKA ammonia).

11. Aluminum fluoride plus bromine yields aluminum bromide plus fluorine.

12. Hydrochloric acid plus sodium hydroxide yields sodium chloride plus water.

13. Iron plus lead (II) sulfate react forming iron (II) sulfate plus lead.

14. Iron (III) chloride combines with sodium hydroxide to form iron (III) hydroxide and sodium chloride.

- 15.** Sulfuric acid decomposes to form sulfur trioxide gas plus water.
- 16.** Sodium oxide combines with water to form sodium hydroxide.
- 17.** Potassium iodide reacts with bromine forming potassium bromide plus iodine.
- 18.** Sodium phosphate reacts with calcium nitrate to produce sodium nitrate plus calcium phosphate.
- 19.** Zinc reacts with iron (III) chloride yielding zinc (II) chloride plus iron precipitate.
- 20.** Ammonium carbonate and magnesium sulfate react to yield ammonium sulfate plus magnesium carbonate.
- 21.** Phosphoric acid plus calcium hydroxide react forming solid calcium phosphate plus water.
- 22.** Aluminum plus oxygen gas form aluminum oxide.
- 23.** Nitrogen gas plus oxygen gas react to form dinitrogen pentoxide.