Notes – Chemical Reactions

Evidence of a chemical change (chemical reaction)

1. color change
2. odor change
3. bubbles form (a gas)
4. a solid forms (a precipitate)
5. H_2O forms
6. change in energy (temperature)

Terms to Know

1. Reactant - starting substances in a chemical reaction
2. Product - substances formed in a chemical reaction
3. + separates 2 reactants or 2 products
4. → yields (produces)
5. (s) solid
6. (l) liquid
7. (g) gas
8. (aq) aqueous (dissolved in H_2O, a solution)
9. Vapor - gas
10. Precipitate a solid that forms from 2 liquids

7 Diatomic Elements – there are 7 elements that exist as diatomic molecules because they are more stable that way.

H_2 O_2 N_2 Cl_2 Br_2 I_2 F_2

Representing Chemical Reactions – Skeleton Equations

$R_1 + R_2 \rightarrow P_1$

1. Sodium metal reacts with chlorine gas to produce sodium chloride crystals.

$Na(s) + Cl_2(g) \rightarrow NaCl(s)$

$R_1 + R_2 \rightarrow P_1 + P_2$

2. Calcium metal reacts with nitric acid solution to produce a solution of calcium nitrate and hydrogen gas.

$Ca(s) + HNO_3(aq) \rightarrow Ca(NO_3)_2(aq) + H_2(g)$

$R_1 \rightarrow P_1 + P_2$

3. Solid potassium chlorate decomposes into solid potassium chloride and oxygen gas.

$KClO_3(s) \rightarrow KCl(s) + O_2(g)$

$R_1 + R_2 \rightarrow P_1 + P_2$

4. Solutions of hydrochloric acid and strontium hydroxide react to produce a solution of strontium chloride and water.

$HCl(aq) + Sr(OH)_2(aq) \rightarrow SrCl_2(aq) + H_2O(l)$

$R_1 + R_2 \rightarrow P_1 + P_2$

5. Liquid butane (C_4H_{10}) is burned in the presence of oxygen gas in air to produce carbon dioxide gas and water vapor.

$C_4H_{10}(l) + O_2(g) \rightarrow CO_2(g) + H_2O(g)$

$R_1 + R_2 \rightarrow P_1 + P_2$

6. In photosynthesis, liquid glucose ($C_6H_{12}O_6$) and oxygen gas are produced when carbon dioxide gas and water react in the presence of sunlight.

$C_6H_{12}O_6(l) + O_2(g) \xleftarrow{h\nu} CO_2(g) + H_2O(l)$

$E = h\nu$