Worksheet SNC 2DI - Types of Chemical Reactions

Part A: Write a balanced equation for each of the following:

1. Synthesis Reactions (A + B ➔ AB)

   1) Calcium metal reacts with chlorine gas to yield calcium chloride.

   2) Nitrogen gas reacts with hydrogen gas to produce ammonia (NH_3) gas.

   3) Iron reacts with oxygen gas at high temperatures to produce iron (III) oxide.

2. Decomposition Reactions (AB ➔ A + B)

   1) Calcium carbonate decomposes into calcium oxide and carbon dioxide.

   2) TNT ($C_7H_5(NO_2)_3$) explodes to produce carbon monoxide gas, carbon soot, hydrogen gas, and nitrogen gas.

3. Displacement Reactions (A + BC ➔ AC + B)

   1) Copper in copper (II) sulfate is replaced by aluminum.

   2) Gold is deposited from a solution of gold (II) nitrate in the presence magnesium.

   3) Aluminum reacts with H_2SO_4 to produce hydrogen gas and one other compound.

4. Double Displacement Reactions (AB + CD ➔ AD + CB)

   1) Insoluble silver chloride is produced when a solution of silver nitrate is added to a solution of ferric chloride (iron (III) chloride.

   2) Ammonium hydroxide reacts with chromium (III) sulfate.

   3) Sodium hydroxide neutralizes H_2CO_3 acid.

Part B: Write a balanced equation and indicate the type of chemical reaction for each of the following:

1. C_2H_2 + O_2 ➔ CO_2 + H_2O

2. H_2SO_4 + $Fe(OH)_3$ ➔ $Fe_2(SO_4)_3$ + H_2O

3. lead (II) nitrate + sodium hydroxide ➔ lead (II) hydroxide + sodium nitrate

4. Al_4C_3 + water ➔ aluminum hydroxide + carbon tetrahydride

5. Sodium metal reacts with water to yield sodium hydroxide and hydrogen gas.

6. Aluminum metal is placed into a solution of copper (II) sulphate ➔

7. Propane (C_3H_8) burns with oxygen to produce carbon dioxide and water.

8. barium acetate + sulphuric acid ➔ barium sulphate + acetic acid

9. Zinc sulfide burns in air (What gas in the air is needed for combustion?)

10. Calcium chlorate is reacted with sodium carbonate.

11. Zirconium (IV) sulfate is reacted with sodium phosphate.

12. Hydrogen sulfide is added to arsenic pentachloride.