**Chemistry 20**

**Lessons 1 to 8 Review**

Fill in the following table:

|  |  |  |
| --- | --- | --- |
| **Chemical Formula** | **Name of Compound** | **Molecular or Ionic (M or I)** |
| NaCl(s) |  |  |
|  | sodium hydrogen sulfate |  |
|  | sodium hydroxide |  |
| CaCO3 (s) |  |  |
| P2O5 (s) |  |  |
|  | magnesium sulfate heptahydrate |  |
|  | carbon dioxide |  |
| Na2SiO3 |  |  |
| N2O |  |  |
| Ca(HCO3)2 |  |  |
|  | sodium thiosulfate pentahydrate |  |
|  | potassium hypochlorite |  |
|  | oxygen |  |
|  | potassium nitrate |  |
| Ca(OH)2 (s) |  |  |
|  | aluminum oxide |  |
|  | iodine |  |
| Na2CO3 (s) |  |  |
|  | potassium hydroxide |  |
| SO3 |  |  |
|  | carbon monoxide |  |
| Fe2O3 |  |  |
|  | ammonium hydrogen phosphate |  |
| SnF2 |  |  |
|  | calcium oxide |  |
| CS2 |  |  |
| CaCl2 (s) |  |  |
| NO(g) |  |  |
|  | ammonium phosphate |  |
| Cu2O |  |  |

**Moles and masses**

1. Determine the molar mass of each of the following substances.

(a) MgI2 (b) Al(OH)3 (s)

(c) (NH4)2CO3 (d) CoCl2 • 6H2O

2. Convert each of the following masses into an amount in moles of the given substance.

(a) 8.40 g of NaOH

(b) 4.2 kg of H2O

3. Convert each of the following amounts into a mass in grams of the given substance.

(a) 0.456 mol of Al2(SO4)3

(b) 0.518 mmol of CuSO4 • 5H2O

**Chemical equations**

Complete the following chemical equations:

1. Iron pipes are strongly attacked and corroded by sulfuric acid. (iron (II) sulfate is one product)

Balanced reaction:

Reaction type:

2. Octane (C8H18) undergoes complete combustion.

Balanced reaction:

Reaction type:

3. Copper metal reacts in a solution of zinc nitrate.

Balanced reaction:

Reaction type:

4. When a current is run through water, hydrogen gas and oxygen gas are released.

Balanced reaction:

Reaction type:

5. A precipitate forms when sodium chloride is mixed with lead (II) acetate.

Balanced reaction:

Reaction type:

6. Nitric acid may be neutralized with barium hydroxide.

Balanced reaction:

Reaction type:

7. Calcium reacts vigorously with hydrochloric acid.

Balanced reaction:

Reaction type:

8. Aluminum metal reacts with hot water. (Hint: Treat water as HOH.)

Balanced reaction:

Reaction type:

9. Chlorine gas reacts with a solution of potassium iodide.

Balanced reaction:

Reaction type:

**Stoichiometry**

Calculate the following:

1. If a solution containing 14.3 g of calcium nitrate reacts with a sufficient quantity of sodium carbonate solution, what mass of calcium carbonate would be produced?

2. What mass of calcium carbonate forms when 24.5 g of potassium carbonate is mixed in a concentrated solution of calcium nitrate.

3. 43.7 g of propane (C3H8) is burned in oxygen. What mass of products would be produced?

4. 24.0 g of sodium chloride and some water are products of a neutralization reaction. What masses of reactants were required?

5. Lithium reacts with the air to form its oxide. What mass of lithium oxide is formed when 3.57 g of lithium undergoes this reaction?

6. Cesium reacts violently with water. If 15.0 g of cesium are used, how much hydrogen gas will be produced?