**Synthesis, Decomposition, Combustion and Roasting Equations**

1) Solid iron (III) hydroxide is heated.

**D 2Fe(OH)3 (s) → Fe2O3 (s) + 3H2O (g)**

2) Butane gas (C4H10) burns in excess oxygen.

**C 2C4H10 (g) + 13O2 (g) → 8CO2 (g) + 10H2O (g)**

3) Butane burns in limited oxygen.

**C (limit) 2C4H10 (g) + 9O2 (g) → 8CO (g) + 10H2O (g)**

4) Solid iron (III) oxide undergoes electrolysis.

**D 2Fe2O3 (s) --e-→ 4Fe (s) + 3O2 (g)**

5) Calcium reacts with phosphorus (P4).

**S 6Ca (s) + P4 (s) → 2Ca3P2 (s)**

6) Grain Alcohol vapor (C2H5OH - ethanol) burns excess oxygen.

**C C2H5OH (g) + 3O2 (g) → 2CO2 (g) + 3H2O (g)**

7) Molten sodium chloride is split by electrolysis.

**D 2NaCl(l) --e-→ 2Na(s) + Cl2(g)**

8) Solid Fe3S4 is heated with excess oxygen.

**R Fe3S4 (s) + 6O2 (g) → Fe3O4 (s) + 4SO2 (g)**

9) Solid potassium carbonate is heated.

**D K2CO3 (s) --∆→ K2O (s) + CO2 (g)**

10) Oxygen reacts with sulfur (S8) to form sulfur trioxide.

**S 12O2 (g) + S8 (s) → 8SO3(g)**

11) Phosphorus (P4) reacts with nitrogen to form diphosphorus heptanitride.

**S P4(s) + 7N2 (g) → 2P2N7(s)**

**12) Sulfur trioxide gas reacts with water.**

**S SO3(g) + H2O(l) → H2SO4(aq)**

13) Glucose (C6H12O6) is “burned” by your cells.

**C C6H12O6 (s) + 6O2 (g) → 6CO2 (g) + 6H2O (g)**

14) Nickel reacts with chlorine gas. (Nickel III ion forms.)

**S 2Ni (s) + 3Cl2 (g) → 2NiCl3 (s)**

15) Acetone (C3H6O) burns completely in air.

**C C3H6O (g) + 4O2 (g) → 3CO2 (g) + 3H2O (g)**

16) Dinitrogen trioxide gas reacts with water.

**S N2O3 (g) + H2O (l) → 2HNO2 (aq)**

17) Solid aluminum chlorite is heated.

**D Al(ClO2)3 (s) --∆→ AlCl3 (s) + 3O2 (g)**

18) Solid lead (IV) sulfide is heated with limited oxygen.

**R PbS2 (s) + O2 (g) → PbO2 (s) + 2S (s)**

19) Sodium oxide reacts with water.

**S Na2O(s) + H2O(l) → 2NaOH(aq) or (s)**

20) Solid manganese (VII) bromide is decomposed by heat.

**D 2MnBr7 (s) --∆→ 2Mn (s) + 7Br2 (g) or (l )**

21) Solid cobalt (III) bicarbonate is heated.

**D 2Co(HCO3)3 (s) --∆→ Co2O3 (s) + 3H2O (g) + 6CO2 (g)**

22) Aqueous sulfurous acid is heated.

**D H2SO3 (aq) --∆→ SO2 (g) + H2O (g)**

23) Lithium oxide combines with carbon dioxide to make a carbonate compound.

**S Li2O (s) + CO2 (g) → Li2CO3 (s)**

24) Aqueous perchloric acid is heated.

**D 2HClO4 (aq) --∆→ Cl2O7 (g) + H2O (g)**

25) Cobalt combines with carbon. (Cobalt III ion forms.)

**S 4Co (s) + 3C (s) → Co4C3 (s)**