KEY

Practice Predicting Products of Reactions

Directions:
a. Write the formulas for the following reactants.
b. Predict the products and write formulas for them.
c. Balance the equation.
d. Classify the reaction as synthesis, decomposition, single displacement, double displacement/ neutralization, double displacement/precipitation, or combustion.

NOTE: to **burn** means to add oxygen (O_2) and this is **NOT** the same as heating. Do not forget about the diatomic elements (**BrINClHOF**).

C/S 1. The burning (or combustion) of solid lithium →

$$4\,Li_{(s)} + O_{2\,(g)} \rightarrow 2\,Li_2O_{(s)}$$

S 2. Solid calcium oxide and water →

calcium hydroxide (a base)

$$CaO_{(s)} + H_2O_{(l)} \rightarrow Ca(OH)_{2\,(aq)}$$

S 3. Sulfur trioxide gas and water →

sulfuric acid

$$SO_{3\,(g)} + H_2O_{(l)} \rightarrow H_2SO_{4\,(aq)}$$

S 4. Solid aluminum and bromine gas→

$$2Al_{(s)} + 3Br_{2\,(g)} \rightarrow 2AlBr_{3\,(s)}$$

D 5. Solid barium hydroxide is heated →

$$Ba(OH)_{2\,(s)} \rightarrow BaO_{(s)} + H_2O_{(g)}$$

D 6. Solid magnesium chlorate is heated →

$$Mg(ClO_3)_2 \rightarrow MgCl_{2\,(s)} + 3O_{2\,(g)}$$

D 7. Electrolysis of molten aluminum oxide →

$$2Al_2O_{3\,(l)} \longrightarrow 4Al_{(s)} + 3O_{2\,(g)}$$

D 8. Solid sodium carbonate is heated →

$$Na_2CO_{3\,(s)} \rightarrow Na_2O_{(s)} + CO_{2\,(g)}$$

SR 9. Solid sodium metal and water →

$$2Na_{(s)} + 2H_2O_{(l)} \rightarrow 2NaOH_{(aq)} + H_{2\,(g)}$$

Na replaces one H in H_2O → (H)–OH

SR 10. Iron(II) filings are added to aqueous copper(II) sulfate →

$$Fe_{(s)} + CuSO_{4(aq)} \rightarrow FeSO_{4(aq)} + Cu_{(s)}$$

SR 11. Solid potassium metal and hydrochloric acid →

$$2K_{(s)} + 2HCl_{(aq)} \rightarrow 2KCl_{(aq)} + H_{2(g)}$$

SR 12. Fluorine gas and solid calcium chloride →

$$F_{2(g)} + CaCl_{2(s)} \rightarrow CaF_{2(s)} + Cl_{2(g)}$$

DR (ppt) 13. Aqueous potassium iodide and aqueous lead (II) nitrate →

$$KI_{(aq)} + Pb(NO_3)_{2(aq)} \rightarrow PbI_{2(s)} + 2KNO_{3(aq)}$$

DR (NR) 14. Aqueous sodium hydroxide and aqueous barium chloride → NR

$$2NaOH_{(aq)} + BaCl_{2(aq)} \rightarrow Ba(OH)_{2(aq)} + 2NaCl_{(aq)}$$

DR (neut) 15. Aqueous sodium hydroxide and hydrochloric acid →

$$NaOH_{(aq)} + HCl_{(aq)} \rightarrow NaCl_{(aq)} + H_2O$$

C 16. The burning of propane (tricarbon octahydride) →

$$C_3H_{8(g)} + 5O_{2(g)} \rightarrow 3CO_{2(g)} + 4H_2O_{(g)}$$

C 17. The burning of methane (carbon tetrahydride) →

$$CH_{4(g)} + 2O_{2(g)} \rightarrow CO_{2(g)} + 2H_2O_{(g)}$$

S 18. Solid magnesium oxide and water →

$$MgO_{(s)} + H_2O_{(l)} \rightarrow Mg(OH)_{2(s)}$$

S 19. Carbon dioxide gas and water →

$$CO_{2(g)} + H_2O_{(l)} \rightarrow H_2CO_{3(aq)}$$

S 20. Solid iron and oxygen gas →

$$4Fe_{(s)} + 3O_{2(g)} \rightarrow 2Fe_2O_{3(s)}$$

iron (III) oxide

or

$$2Fe_{(s)} + O_{2(g)} \rightarrow 2FeO_{(s)}$$

iron (II) oxide