**EQUATIONS WORKSHEET** NAME _Key_ _____

Last   First

A) Write balanced chemical equations for the reactions given below.
B) Classify the reaction type as a) combination, b) decomposition, c) single-replacement, d) double-replacement, or e) combustion.
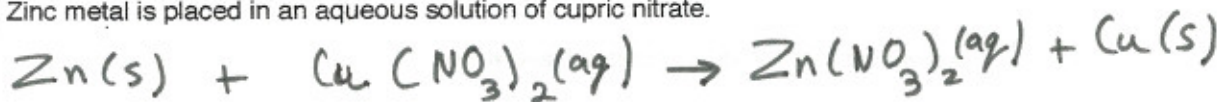C) Write the physical state for each reactant and product.

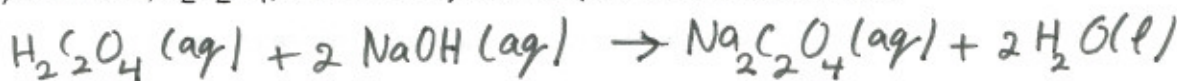**D** 1) Aqueous solutions of calcium chloride and silver nitrate are mixed.

$$CaCl_2\,(aq) + 2\,AgNO_3\,(aq) \rightarrow Ca(NO_3)_2\,(aq) + 2\,AgCl\,(s)$$
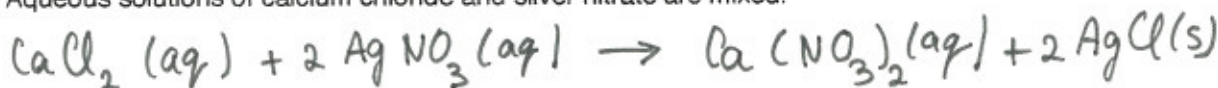
A 2) Sulfur dioxide gas is bubbled through liquid water forming sulfurous acid.

$$SO_2\,(g) + H_2O\,(l) \rightarrow H_2SO_3\,(aq)$$
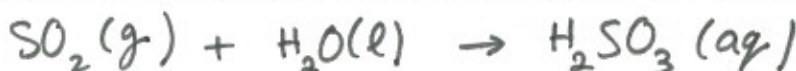
C 3) Zinc metal is placed in an aqueous solution of cupric nitrate.

$$Zn\,(s) + Cu(NO_3)_2\,(aq) \rightarrow Zn(NO_3)_2\,(aq) + Cu\,(s)$$

D 4) Oxalic acid, $H_2C_2O_4$, and sodium hydroxide aqueous solutions are mixed.

$$H_2C_2O_4\,(aq) + 2\,NaOH\,(aq) \rightarrow Na_2C_2O_4\,(aq) + 2\,H_2O\,(l)$$

B 5) Solid cupric hydroxide is heated.

$$Cu(OH)_2\,(s) \xrightarrow{\Delta} CuO\,(s) + H_2O\,(g)$$

D 6) Aqueous solutions of ferric chloride and potassium phosphate are mixed.

$$FeCl_3\,(aq) + K_3PO_4\,(aq) \rightarrow FePO_4\,(s) + 3\,KCl\,(aq)$$
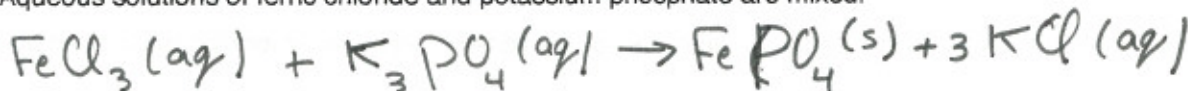
E 7) Gaseous butane, C_4H_{10}, is burned in air.

$$2\,C_4H_{10}\,(g) + 13\,O_2 \rightarrow 8\,CO_2\,(g) + 10\,H_2O\,(g)$$
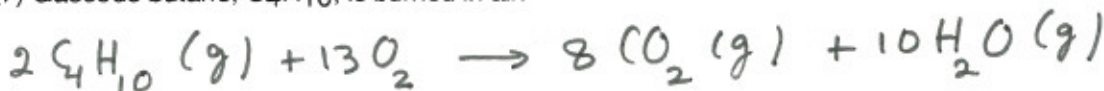
B 8) Molten sodium chloride is decomposed by applying electric energy.

$$2\,NaCl\,(l) \rightarrow 2\,Na\,(s) + Cl_2\,(g)$$

C 9) Magnesium metal is placed in hydrochloric acid.

$$Mg\,(s) + 2\,HCl\,(aq) \rightarrow MgCl_2\,(aq) + H_2\,(g)$$
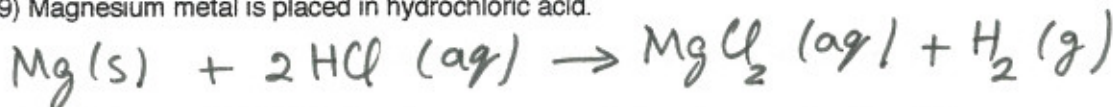
C 10) Chlorine gas is bubbled through an aqueous solution of magnesium bromide.

$$Cl_2\,(g) + MgBr_2\,(aq) \rightarrow MgCl_2\,(aq) + Br_2\,(l)$$
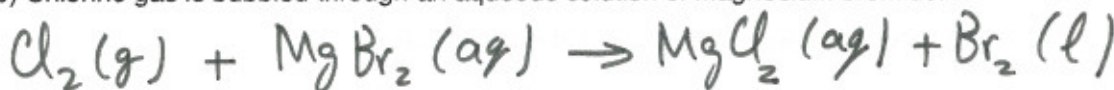
B 11) Solid magnesium carbonate is heated.

$$MgCO_3\,(s) \xrightarrow{\Delta} MgO\,(s) + CO_2\,(g)$$
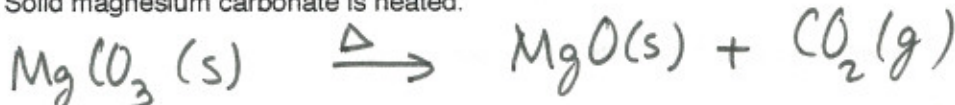
B 12) Decomposition of aqueous hydrogen peroxide in the presence of manganese dioxide

catalyst. $$2\,H_2O_2\,(aq) \rightarrow 2\,H_2O\,(l) + O_2\,(g)$$ **(Next page)**
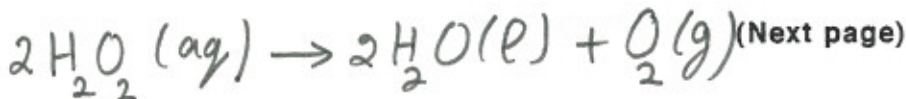
A ___ 13) Solid potassium oxide is mixed with carbon dioxide gas.

$$K_2O(s) + CO_2(g) \longrightarrow K_2CO_3(s)$$
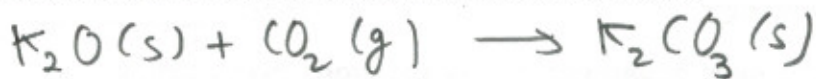
C ___ 14) Sodium metal is placed in liquid water.

$$2Na(s) + 2H_2O(l) \longrightarrow 2NaOH(aq) + H_2(g)$$

A ___ 15) Solid sodium oxide is placed in liquid water.

$$Na_2O(s) + H_2O(l) \longrightarrow 2NaOH(aq)$$
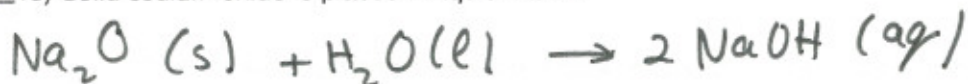
B ___ 16) Decomposition of solid sodium nitrate.

$$2NaNO_3(s) \xrightarrow{\Delta} 2NaNO_2(s) + O_2(g)$$
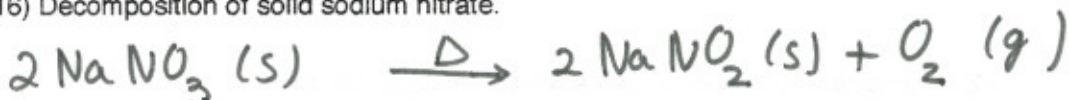
A ___ 17) Solid calcium oxide is added to liquid water.

$$CaO(s) + H_2O(l) \longrightarrow Ca(OH)_2(aq)$$
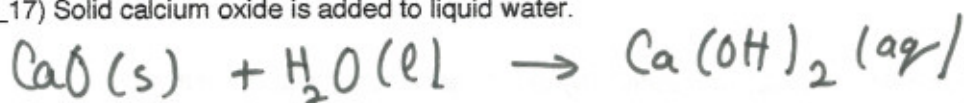
D ___ 18) Aqueous solutions of potassium iodide and lead (II) nitrate are mixed.

$$2KI(aq) + Pb(NO_3)_2(aq) \longrightarrow 2KNO_3(aq) + PbI_2(s)$$
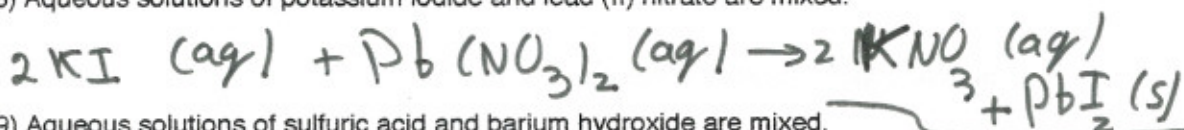
D ___ 19) Aqueous solutions of sulfuric acid and barium hydroxide are mixed.

$$H_2SO_4(aq) + Ba(OH)_2(aq) \longrightarrow BaSO_4(s) + 2H_2O(l)$$
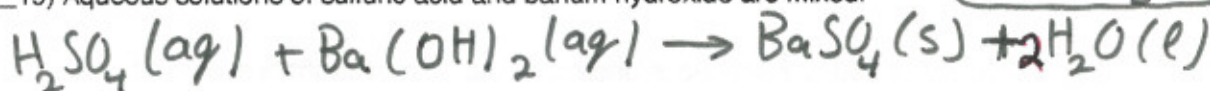
A ___ 20) Diphosphorus pentoxide solid is added to liquid water forming phosphoric acid.

$$P_2O_5(s) + 3H_2O(l) \longrightarrow 2H_3PO_4(aq)$$
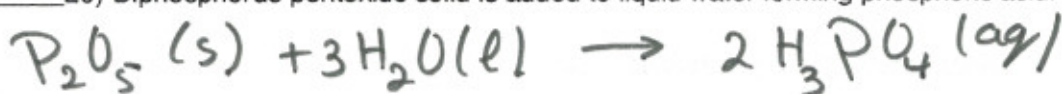
B ___ 21) Decomposition of solid calcium sulfite.

$$CaSO_3(s) \longrightarrow CaO(s) + SO_2(g)$$
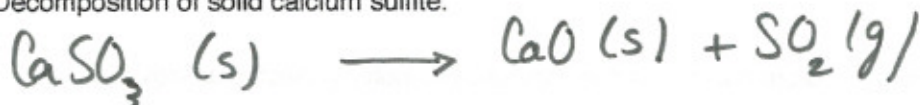
A ___ 22) Solid magnesium oxide and sulfur dioxide gas are mixed.

$$MgO(s) + SO_2(g) \longrightarrow MgSO_3(s)$$
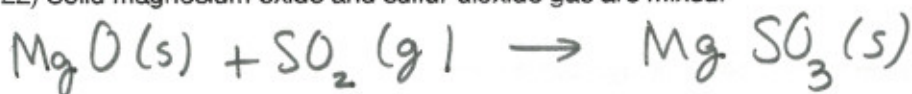
C ___ 23) Calcium metal is added to aqueous sulfuric acid.

$$Ca(s) + H_2SO_4(aq) \longrightarrow CaSO_4(s) + H_2(g)$$
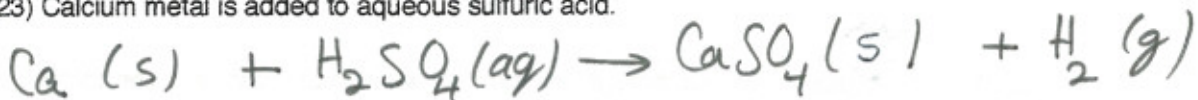
A ___ 24) Solid magnesium oxide is added to liquid water.

$$MgO(s) + H_2O(l) \longrightarrow Mg(OH)_2(s)$$
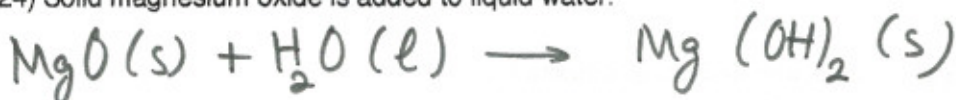
B ___ 25) Decomposition of solid sodium peroxide.

$$2Na_2O_2(s) \longrightarrow 2Na_2O(s) + O_2(g)$$
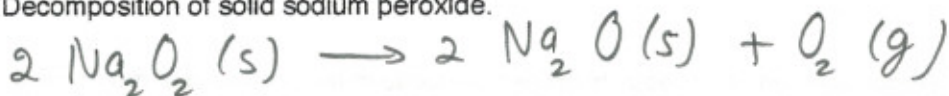
B ___ 26) Decomposition of potassium chlorate.

$$2KClO_3(s) \longrightarrow 2KCl(s) + 3O_2(g)$$