1. Balance and classify the following reactions: combination (C), decomposition (D), single replacement (SR), double replacement (DR) or combustion (CB).

Classification

a. $\_1\_ C_3H_8\ (g) + \_5\_ O_2\ (g) \rightarrow \_3\_ CO_2\ (g) + \_4\_ H_2O\ (l)$ CB

b. $\_2\_ K\ (s) + \_2\_ H_2O\ (l) \rightarrow \_2\_ KOH\ (aq) + \_1\_ H_2\ (g)$ SR

c. $\_1\_ MgSO_4\ (aq) + \_1\_ Na_2CO_3\ (aq) \rightarrow \_1\_ MgCO_3\ (s) + \_1\_ Na_2SO_4\ (aq)$ DR

d. $\_1\_ Cl_2\ (g) + \_2\_ NaI\ (s) \rightarrow \_2\_ NaCl\ (s) + \_2\_ I_2\ (s)$ SR

e. $\_2\_ NaNO_3\ (s) \rightarrow \_2\_ NaNO_2\ (s) + \_1\_ O_2\ (g)$ D

f. $\_1\_ H_2\ (g) + \_1\_ Cl_2\ (g) \rightarrow \_2\_ HCl\ (g)$ C

g. $\_3\_ Ca(C_2H_3O_2)_2\ (aq) + \_2\_ H_3PO_4\ (aq) \rightarrow \_1\_ Ca_3(PO_4)_2\ (s) + \_6\_ HC_2H_3O_2\ (aq)$ DR

h. $\_2\_ H_2O_2\ (l) \rightarrow \_2\_ H_2O\ (l) + \_1\_ O_2\ (g)$ D

i. $\_2\_ Na\ (s) + \_1\_ S\ (s) \rightarrow \_1\_ Na_2S\ (s)$ C

j. $\_1\_ BaCl_2\ (aq) + \_1\_ K_2CrO_4\ (aq) \rightarrow \_1\_ BaCrO_4\ (s) + \_2\_ KCl\ (aq)$ DR

2. Balance each of the following equations. Then write the total (complete) ionic equation for each reaction. Finally write the net ionic equation for each reaction. ***Remember: insoluble substances are not present as separate ions in solution.***

a. 1 $Pb(NO_3)_2$ (aq) + 2 NaOH (aq) → 1 $Pb(OH)_2$ (s) + 2 $NaNO_3$ (aq)

Complete Ionic equation: Pb+2(aq)+2NOs-(aq)+2O-2(aq)+2h+(aq) ---> Pb(OH2)(s)+ 2Na+ +2No-3

Net ionic equation: Pb+2(aq)+2O-2(aq)+2h+(aq)--->Pb(OH2)(s)

b. 2 Na_3PO_4 (aq) + 1 $Ca(NO_3)_2$ (aq) → 1 $Ca_3(PO_4)_2$ (s) + 1 $NaNO_3$ (aq)

Complete Ionic equation: 2Na+3+2PO-3 4+ 3Ca+2+3NO-3--->CA3(PO4)2+6Na+6NO3-

Net ionic equation: Cl- + Ag +--> AgCl

c. 1 NaCl (aq) + 1 $AgNO_3$ (aq) → 1 AgCl (s) + 1 $NaNO_3$ (aq)

Complete Ionic equation: Na+ + Cl- + Ag+ + NP-3---> AgCl + Na+ + NO-3

Net ionic equation: Cl- + Ag--> AgCl

d. 1 Na_2SO_4 (aq) + 2 $AgNO_3$ (aq) → 1 Ag_2SO_4 (s) + 2 $NaNO_3$ (aq)

Complete Ionic equation: Na2+ + SO4 -2 + 2Ag+ + 2NO3- --> AgCL+ NA+ + No3-

Net ionic equation: SO4 -2 + 2Ag+--> Ag SO4

e. 1 Na_2CO_3 (aq) + 1 $BaCl_2$ (aq) → 1 $BaCO_3$ (s) + 2 NaCl (aq)

Complete Ionic equation: Na2+ + CO3-3 + Ba+2 + Cl2- ---> BCO3+ 2NA+ 2Cl-

Net ionic equation: Co-2 3 + Ba +2 --> BaCO3

f. 1 Na_2CO_3 (aq) + 2 HCl (aq) → 2 NaCl (aq) + 1 H_2O (l) + 1 CO_2 (g)

Complete Ionic equation: Na2+ + C03-2 + 3H+ 2Cl---> 2NA+ 2Cl- + H20 + CO2

Net ionic equation: CO3-2 + 2H+ --> H2O+ CO2