Predicting Products of Chemical Reactions

Name: KEY 2011

Predict the products and balance the following reactions using your reference sheets. Make sure you write states for your products.

Synthesis Reactions:

1) 2 $H_{2\,(g)}$ + 1 $O_{2\,(g)}$ → $2H_2O_{(l)}$
2) 2 $Na_{(s)}$ + 1 $I_{2\,(s)}$ → $2NaI_{(s)}$
3) 3 $Mg_{(s)}$ + 1 $N_{2\,(g)}$ → $Mg_3N_{2\,(s)}$
4) 2 $Li_{(s)}$ + 1 $Br_{2\,(l)}$ → $2LiBr_{(s)}$
5) 16 $Ag_{(s)}$ + 1 $S_{8\,(s)}$ → $8Ag_2S_{(s)}$
6) 4 $Al_{(s)}$ + 3 $O_{2\,(g)}$ → $2Al_2O_{3\,(s)}$

Decomposition Reactions:

1) 2 $LiClO_{3\,(s)}$ → $2LiCl_{(s)} + 3O_{2(g)}$
2) 2 $NaHCO_{3\,(s)}$ → $Na_2O_{(s)} + H_2O_{(l)} + 2CO_{2(g)}$
3) 1 $MgCO_{3\,(s)}$ → $MgO_{(s)} + CO_{2(g)}$
4) 1 $Ba(ClO_3)_{2\,(s)}$ → $BaCl_{2(s)} + 3O_{2(g)}$
5) 2 $Al(HCO_3)_{3\,(s)}$ → $Al_2O_{3(s)} + 3H_2O_{(l)} + 6CO_{2(g)}$

Combustion Reactions:

1) $CH_{4\,(g)}$ + 2 $O_{2\,(g)}$ → $CO_{2(g)} + 2H_2O_{(l)}$
2) 2 $C_4H_{10\,(l)}$ + 13 $O_{2\,(g)}$ → $8CO_{2(g)} + 10H_2O_{(l)}$
3) 2 $C_8H_{18\,(l)}$ + 25 $O_{2\,(g)}$ → $16CO_{2(g)} + 18H_2O_{(l)}$

Double Replacement Reactions:

1) 2 $AgNO_{3\,(aq)}$ + 1 $CaCl_{2\,(aq)}$ → $2AgCl_{(s)} + Ca(NO_3)_{2\,(aq)}$
2) 1 $BaBr_{2\,(aq)}$ + 1 $K_2SO_{4\,(aq)}$ → $BaSO_{4(s)} + 2KBr_{(aq)}$
3) 1 $ZnCr_2O_{7\,(aq)}$ + 2 $NaOH_{(aq)}$ → $Zn(OH)_{2\,(s)} + Na_2Cr_2O_{7\,(aq)}$
4) 3 $NaOH_{(aq)}$ + 1 $Al(C_2H_3O_2)_{3\,(aq)}$ → $3NaC_2H_3O_{2\,(aq)} + Al(OH)_{3\,(s)}$ (FIX →)
5) $Sn(NO_3)_{2\,(aq)}$ + $Li_2CO_{3\,(aq)}$ → $SnCO_{3(s)} + LiNO_{3\,(aq)}$
6) $AlF_{3\,(aq)}$ + $Na_3(PO_4)_{(aq)}$ → $AlPO_{4\,(s)} + NaF_{(aq)}$ (FIX →)

Single Replacement Reactions:

1) 2 $Al_{(s)}$ + 3 $NiBr_{2\,(aq)}$ → $2AlBr_{3(aq)} + 3Ni_{(s)}$
2) $FeCl_{2\,(aq)}$ + $Ag_{(s)}$ → No Rxn
3) $Ba(NO_3)_{2\,(aq)}$ + $Ni_{(s)}$ → No Rxn
4) $Cu_{(s)}$ + $KCl_{(aq)}$ → No Rxn
5) 1 $Mg_{(s)}$ + 1 $Zn(NO_3)_{2\,(aq)}$ → $Mg(NO_3)_{2(aq)} + Zn_{(s)}$
6) 1 $Co_{(s)}$ + 1 $Sn(NO_3)_{2\,(aq)}$ → $Co(NO_3)_{2(aq)} + Sn_{(s)}$