06/04/24

Balance the following unbalanced equations

$SiO_2(s) + HF(g) \rightarrow SiF_4(g) + H_2O(l)$

$SiO_2 + 4HF \longrightarrow SiF_4 + 2H_2O$

$FeS_2(s) + O_2(g) \rightarrow Fe_2O_3(s) + SO_2(g)$

$2\,FeS_2 + \frac{11}{2}O_2 \longrightarrow Fe_2O_3 + 4SO_2$

or

$4\,FeS_2 + 11\,O_2 \longrightarrow 2\,Fe_2O_3 + 8\,SO_2$

$Mg_3N_2(s) + H_2O(l) \rightarrow NH_3(g) + Mg(OH)_2(s)$

$Mg_3N_2 + 6H_2O \longrightarrow 2NH_3 + 3Mg(OH)_2$

$KNO_3(s) + C_{12}H_{22}O_{11}(s) \rightarrow N_2(g) + CO_2(g) + H_2O(l) + K_2CO_3(s)$

$48\,KNO_3 + 5C_{12}H_{22}O_{11} \longrightarrow 24N_2 + 36CO_2 + 55H_2O + 24K_2CO_3$

$Ca_5F(PO_4)_3(s) + H_2SO_4(aq) \rightarrow Ca(H_2PO_4)_2(s) + CaSO_4(s) + HF(g)$

$2\,Ca_5F(PO_4)_3 + 7H_2SO_4 \longrightarrow 3Ca(H_2PO_4)_2 + 7CaSO_4 + 2HF$

$U_3O_8(s) + HNO_3(aq) \rightarrow UO_2(NO_3)_2(s) + NO_2(g) + H_2O(l)$

$U_3O_8 + 8HNO_3 \longrightarrow 3UO_2(NO_3)_2 + 2NO_2 + 4H_2O$

Write both the balanced total ionic equation and the balanced net ionic equation for what happens when a solution of aluminum nitrate is mixed with a solution of sodium carbonate.

$$2Al^{3+}_{(aq)} + 6NO_{3(aq)}^{-} + 6Na^{+}_{(aq)} + 3CO_{3(aq)}^{-2-} \rightarrow 6Na^{+}_{(aq)} + 6NO_{3\,aq}^{-} + Al_2(CO_3)_3(s)$$

$$\text{Net: } 2Al^{3+}_{(aq)} + 3CO_3^{2-}{}_{(aq)} \rightarrow Al_2(CO_3)_3(s)$$

Write both the balanced total ionic equation and the balanced net ionic equation for what happens when a solution of magnesium nitrate is mixed with a solution of ammonium carbonate.

$$Mg^{2+}_{(aq)} + 2NO_{3\,(aq)}^{-} + 2NH_4^{+}{}_{(aq)} + CO_{3\,(aq)}^{-2} \rightarrow 2NH_4^{+}{}_{(aq)} + 2NO_{3(aq)}^{-} + MgCO_3(s)$$

$$\text{Net: } Mg^{2+}_{(aq)} + CO_3^{2-}{}_{(aq)} \rightarrow MgCO_3(s)$$

Write both the balanced total ionic equation and the balanced net ionic equation for what happens when a solution of potassium chloride is mixed with a solution of aluminum nitrate.

$$K^{+}_{(aq)} + Cl^{-}_{(aq)} + Al^{3+}_{(aq)} + 3NO_3^{-}{}_{(aq)} \rightarrow K^{+}_{(aq)} + Cl^{-}_{(aq)} + Al^{3+}_{3(aq)} + 3NO_3^{-}{}_{(aq)}$$

Net: