Br_2 I_2 N_2 Cl_2 H_2 O_2 F_2

Putting it All Together

Write a BALANCED chemical equation to represent each of the following chemical reactions.

Fe S Fe^{+2} S^{-2}

1. iron metal and sulfur powder react to produce solid iron (II) sulfide

$$Fe_{(s)} + S_{(s)} \longrightarrow FeS_{(s)}$$

Zn Cu^{+2} $(SO_4)^{-2}$ Zn^{+2} $(SO_4)^{-2}$ Cu

2. zinc metal and solid copper (II) sulfate react to produce solid zinc sulfate and copper metal

$$Zn_{(s)} + Cu(SO_4)_{(s)} \longrightarrow Zn(SO_4)_{(s)} + Cu_{(s)}$$

Ag^{+1} $(NO_3)^{-1}$ Na^{+} Br^{-1} Na^{+1} $(NO_3)^{-1}$

3. solutions of silver nitrate and sodium bromide react to produce a solution of sodium nitrate and solid silver bromide

Ag^{+1} Br^{-1}

$$Ag(NO_3)_{(aq)} + NaBr_{(aq)} \longrightarrow Na(NO_3)_{(aq)} + AgBr_{(s)}$$

4. solid potassium chlorate is heated to produce solid potassium chloride and oxygen gas

K^{+1} $(ClO_3)^{-1}$ K^{+} Cl^{-1} ↖diatomic

$$2K(ClO_3)_{(s)} \longrightarrow 2KCl_{(s)} + 3O_{2(g)}$$

5. liquid water breaks down to produce hydrogen gas and oxygen gas

H_2O diatomics

$$2H_2O_{(l)} \longrightarrow 2H_{2(g)} + O_{2(g)}$$

6. solid mercury (II) oxide is heated and breaks down into mercury metal and oxygen gas

Hg^{+2} O^{-2} Hg ↑liquid ↖diatomic

$$2HgO_{(s)} \longrightarrow 2Hg_{(l)} + O_{2(g)}$$

K^{+1} I^{-1} Pb^{+2} $(NO_3)^{-1}$ Pb^{+2} I^{-1}

7. solutions of potassium iodide and lead (II) nitrate react to form solid lead (II) iodide and aqueous potassium nitrate

K^{+} $(NO_3)^{-1}$

$$2KI_{(aq)} + Pb(NO_3)_{2(aq)} \longrightarrow PbI_{2(s)} + 2K(NO_3)_{(aq)}$$

Al diatomic $Al^{+3}\ O^{-2}$

8. aluminum metal and oxygen gas react to produce solid aluminum oxide

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

Mg^{+2} Cl^{-1} $(NH_4)^{+1}(NO_3)^{-1}$

9. solutions of magnesium chloride and ammonium nitrate react to produce a solution of magnesium nitrate and solid ammonium chloride

Mg^{+2} $(NO_3)^{-1}$ $(NH_4)^{+1}$ Cl^{-1}

$$MgCl_{2(aq)} + 2(NH_4)(NO_3)_{(aq)} \longrightarrow Mg(NO_3)_{2(aq)} + 2(NH_4)Cl$$

Fe^{+3} Cl^{-1} $(NH_4)^{+1}$ $(OH)^{-1}$

10. solid iron (III) chloride and aqueous ammonium hydroxide react to produce aqueous iron (III) hydroxide and solid ammonium chloride

Fe^{+3} $(OH)^{-1}$ $(NH_4)^{+1}$ Cl^{-1}

$$FeCl_{3(s)} + 3(NH_4)(OH)_{(aq)} \longrightarrow Fe(OH)_{3(aq)} + 3(NH_4)Cl_{(s)}$$

11. aqueous sodium peroxide (Na_2O_2) and water react to produce a solution of sodium hydroxide and oxygen gas diatomic Na^{+1} $(OH)^{-1}$

$$Na_2O_{2(aq)} + 2H_2O_{(l)} \longrightarrow 2Na(OH)_{(aq)} + O_{2(g)}$$

Fe^{+3} O^{-2} C Fe Type III

12. solid iron (III) oxide and solid carbon react to produce iron metal and carbon monoxide gas

$$Fe_2O_{3(s)} + 3C_{(s)} \longrightarrow 2Fe_{(s)} + 3CO_{(g)}$$

Fe H_2O

13. iron metal and water react to produce hydrogen gas and solid iron (III) oxide

diatomic $Fe^{+3}\ O^{-2}$

$$2Fe_{(s)} + 3H_2O_{(l)} \longrightarrow 3H_{2(g)} + Fe_2O_{3(s)}$$