

## Writing Equations

Back pg 1 of packet

1.  $\text{CaO(s)} + \text{H}_2\text{O(l)} \rightarrow \text{Ca(OH)}_2\text{(aq)}$
2.  $2\text{AgNO}_3\text{(aq)} + \text{Ni(s)} \rightarrow \text{Ni(NO}_3)_2\text{(aq)} + 2\text{Ag(s)}$
3.  $\text{NaOH(aq)} + \text{HCl(aq)} \rightarrow \text{NaCl(aq)} + \text{H}_2\text{O(l)}$
4.  $\text{NH}_4\text{NO}_2\text{(s)} \rightarrow \text{N}_2\text{(g)} + 2\text{H}_2\text{O(g)}$
5.  $2\text{Al(s)} + 3\text{FeO(s)} \rightarrow \text{Al}_2\text{O}_3 + 3\text{Fe(s)}$
6.  $\text{Zn(s)} + \text{S(s)} \rightarrow \text{ZnS(s)}$
7. Iron + oxygen gas  $\rightarrow$  Iron (III) oxide
8. Water + dinitrogen trioxide  $\rightarrow$  nitrous acid
9.  $2\text{KNO}_3\text{(s)} \rightarrow 2\text{KNO}_2\text{(s)} + \text{O}_2\text{(g)}$
10. Iron (III) oxide + carbon monoxide  $\rightarrow$  Iron + carbon dioxide
11.  $\text{Zn(s)} + 2\text{HCl(aq)} \rightarrow \text{ZnCl}_2\text{(aq)} + \text{H}_2\text{(aq)}$

## Synthesis Reactions

1. water  $2\text{H(g)} + \text{O}_2\text{(g)} \rightarrow 2\text{H}_2\text{O(l)}$
2. hydrogen chloride  $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$
3. hydrogen iodide  $\text{H}_2 + \text{I}_2 \rightarrow 2\text{HI}$
4. sodium oxide  $4\text{Na} + \text{O}_2 \rightarrow 2\text{Na}_2\text{O}$
5. Potassium chloride  $2\text{K} + \text{Cl}_2 \rightarrow 2\text{KCl}$
6. Lithium iodide  $2\text{Li} + \text{I}_2 \rightarrow 2\text{LiI}$
7. calcium fluoride  $\text{Ca} + \text{F}_2 \rightarrow \text{CaF}_2$
8. magnesium chloride  $\text{Mg} + \text{Cl}_2 \rightarrow \text{MgCl}_2$
9. Beryllium iodide  $\text{Be} + \text{I}_2 \rightarrow \text{BeI}_2$
10. Strontium bromide  $\text{Sr} + \text{Br}_2 \rightarrow \text{SrBr}_2$
11. Calcium oxide  $2\text{Ca} + \text{O}_2 \rightarrow 2\text{CaO}$
12. Magnesium oxide  $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO(s)}$
13. Boron chloride  $2\text{B} + 3\text{Cl}_2 \rightarrow 2\text{BCl}_3\text{(s)}$

14. Aluminum iodide  $2\text{Al} + 3\text{I}_2 \rightarrow 2\text{AlI}_3(\text{s})$
15.  $2\text{Cu}(\text{s}) + \text{O}_2(\text{g}) \rightarrow 2\text{CuO}(\text{s})$
16. Copper (I) oxide  $4\text{Cu}(\text{s}) + \text{O}_2(\text{g}) \rightarrow 2\text{Cu}_2\text{O}(\text{s})$
17.  $2\text{Pb}(\text{s}) + \text{O}_2(\text{g}) \rightarrow 2\text{PbO}$
18.  $\text{Pb}(\text{s}) + \text{O}_2(\text{g}) \rightarrow \text{PbO}_2(\text{s})$
19.  $\text{Fe} + \text{Cl}_2 \rightarrow \text{FeCl}_2$
20.  $2\text{Fe} + 3\text{Cl}_2 \rightarrow 2\text{FeCl}_3(\text{s})$
21.  $\text{CuO}(\text{s}) + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2(\text{aq})$
22.  $\text{Na}_2\text{O} + \text{H}_2\text{O} \rightarrow 2\text{NaOH}(\text{aq})$
23.  $\text{MgO} + \text{H}_2\text{O} \rightarrow \text{Mg}(\text{OH})_2(\text{aq})$
24.  $\text{SO}_3 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_4(\text{aq})$
25.  $\text{N}_2\text{O}_5 + \text{H}_2\text{O} \rightarrow 2\text{HNO}_3(\text{aq})$

#### Composition/ decomposition reactions

Back page 2 packet

1.  $\text{CaCO}_3(\text{s}) \rightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$
2.  $2\text{NaOH} \rightarrow \text{Na}_2\text{O}(\text{s}) + \text{H}_2\text{O}(\text{g})$
3.  $2\text{KClO}_3(\text{s}) \rightarrow 2\text{KCl}(\text{s}) + 3\text{O}_2(\text{g})$
4.  $\text{H}_2\text{CO}_3 \rightarrow \text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g})$
5.  $2\text{HgO}(\text{s}) \rightarrow 2\text{Hg}(\text{l}) + \text{O}_2(\text{g})$
6.  $2\text{H}_2\text{O} \xrightarrow{\wedge\wedge\wedge} 2\text{H}_2(\text{g}) + \text{O}_2(\text{g})$
7.  $\text{Ni}(\text{ClO}_3)_2(\text{s}) \rightarrow 2\text{NiCl}(\text{s}) + 3\text{O}_2(\text{g})$
8.  $\text{SO}_3(\text{g}) + \text{H}_2\text{O}(\text{l}) \rightarrow \text{H}_2\text{SO}_4(\text{aq})$
9.  $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \rightarrow 2\text{HCl}(\text{g})$
10.  $\text{Zn}(\text{OH})_2 \rightarrow \text{ZnO} + \text{H}_2\text{O}$
11.  $\text{K}_2\text{O}(\text{s}) + \text{H}_2\text{O} \rightarrow 2\text{KOH}(\text{aq})$
12.  $\text{Na}_2\text{CO}_3(\text{s}) \rightarrow \text{Na}_2\text{O}(\text{s}) + \text{CO}_3(\text{g})$
13.  $2\text{NaCl}(\text{s}) \xrightarrow{\wedge\wedge\wedge} 2\text{Na}(\text{s}) + \text{Cl}_2(\text{g})$

14.  $2\text{Mg(s)} + \text{O}_2\text{(g)} \rightarrow 2\text{ MgO(s)}$
15.  $\text{Cu(OH)}_2 \rightarrow \text{CuO(s)} + \text{H}_2\text{O(l)}$
16.  $3\text{H}_2\text{(g)} + \text{N}_2\text{(g)} \rightarrow 2\text{NH}_3\text{(g)}$
17.  $\text{H}_2\text{SO}_3\text{(aq)} \rightarrow \text{H}_2\text{O(l)} + \text{SO}_2\text{(g)}$
18.  $2\text{Al(s)} + 3\text{ Br}_2\text{(l)} \rightarrow 2\text{AlBr}_3\text{ (s)}$
19.  $\text{Zn(s)} + \text{S(s)} \rightarrow \text{ZnS(s)}$

### Decomposition Reactions

1.  $\text{H}_2\text{CO}_3\text{(s)} \rightarrow \text{H}_2\text{O(g)} + \text{CO}_2\text{(g)}$
2.  $\text{H}_2\text{SO}_4\text{(aq)} \rightarrow \text{H}_2\text{O(l)} + \text{SO}_3\text{(g)}$
3.  $\text{Ca(OH)}_2\text{(s)} \rightarrow \text{CaO(s)} + \text{H}_2\text{O(l or g)}$
4.  $2\text{NaOH(s)} \rightarrow \text{Na}_2\text{O(s)} + \text{H}_2\text{O(g)}$
5.  $2\text{KClO}_3\text{(s)} \rightarrow 2\text{KCl(s)} + 3\text{O}_2\text{(g)}$
6.  $2\text{NaClO}_3\text{(s)} \rightarrow 2\text{NaCl(s)} + 3\text{O}_2\text{(g)}$
7.  $2\text{HgO} \rightarrow 2\text{ Hg(l)} + \text{O}_2\text{(g)}$
8.  $2\text{NaCl(s)} \rightarrow 2\text{Na(s)} + \text{Cl}_2\text{(g)}$
9.  $2\text{H}_2\text{O(l)} \rightsquigarrow 2\text{H}_2\text{(g)} + \text{O}_2\text{(g)}$
10.  $\text{H}_2\text{SO}_3\text{(aq)} \rightarrow \text{H}_2\text{O(l)} + \text{SO}_2\text{ (g)}$
11.  $\text{Cu(OH)}_2\text{(s)} \rightarrow \text{CuO(s)} + \text{H}_2\text{O(g) or (l)}$
12.  $\text{Zn(OH)}_2\text{(s)} \rightarrow \text{ZnO(s)} + \text{H}_2\text{O(g)}$
13.  $\text{Ni(ClO}_3)_2\text{(s)} \rightarrow \text{NiCl}_2\text{(s)} + 3\text{O}_2\text{(g)}$
14.  $\text{Na}_2\text{CO}_3\text{(s)} \rightarrow \text{Na}_2\text{O(s)} + \text{CO}_2\text{(g)}$
15.  $\text{Li}_2\text{CO}_3\text{(s)} \rightarrow \text{Li}_2\text{O(s)} + \text{CO}_2\text{(g)}$
16.  $\text{Be(OH)}_2\text{(s)} \rightarrow \text{BeO(s)} + \text{H}_2\text{O(g)}$
17.  $\text{CaCO}_3\text{(s)} \rightarrow \text{CaO(s)} + \text{CO}_2\text{(g)}$
18.  $2\text{KI(s)} \rightarrow 2\text{K(s)} + \text{I}_2\text{(s)}$
19.  $2\text{HNO}_2\text{(aq)} \rightarrow \text{H}_2\text{O(l)} + \text{N}_2\text{O}_3\text{(g)}$
20.  $2\text{ZnO(s)} \rightarrow 2\text{Zn(s)} + \text{O}_2\text{(g)}$



### **Replacement Rxns**

1.  $\text{Mg}(\text{s}) + \text{Zn}(\text{NO}_3)_2(\text{aq}) \rightarrow \text{Mg}(\text{NO}_3)_2(\text{aq}) + \text{Zn}(\text{s})$
2.  $2\text{Na}(\text{s}) + 2\text{H}_2\text{O}(\text{l}) \rightarrow 2\text{NaOH}(\text{aq}) + \text{H}_2(\text{g})$
3.  $\text{Ca}(\text{s}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{CaSO}_4(\text{aq}) + \text{H}_2(\text{g})$
4.  $\text{Cl}_2(\text{g}) + 2\text{NaBr}(\text{aq}) \rightarrow 2\text{NaCl}(\text{aq}) + \text{Br}_2(\text{g})$
5.  $2\text{Al}(\text{s}) + 3\text{CuSO}_4(\text{aq}) \rightarrow \text{Al}_2(\text{SO}_4)_3(\text{aq}) + 3\text{Cu}(\text{s})$
6.  $\text{Cu}(\text{s}) + \text{KCl}(\text{aq}) \rightarrow \text{N.R.}$
7.  $\text{Ba}(\text{s}) + 2\text{HCl}(\text{aq}) \rightarrow \text{BaCl}_2(\text{aq}) + \text{H}_2(\text{g})$
8.  $2\text{K}(\text{s}) + 2\text{H}_2\text{O}(\text{l}) \rightarrow 2\text{KOH}(\text{aq}) + \text{H}_2(\text{g})$
9.  $\text{Ag}(\text{s}) + \text{H}_2\text{O} \rightarrow \text{N.R.}$
10.  $\text{Cu}(\text{s}) + \text{HCl}(\text{aq}) \rightarrow \text{N.R.}$
11.  $\text{Br}(\text{l}) + \text{NaCl}(\text{aq}) \rightarrow \text{N.R.}$
12.  $\text{Fe}(\text{s}) + \text{Ni}(\text{NO}_3)_2(\text{aq}) \rightarrow \text{Fe}(\text{NO}_3)_2(\text{aq}) + \text{Ni}(\text{s})$
13.  $\text{Ca}(\text{s}) + 2\text{H}_2\text{O}(\text{l}) \rightarrow \text{Ca}(\text{OH})_2(\text{aq}) + \text{H}_2(\text{g})$
14.  $2\text{AlBr}_3(\text{aq}) + 3\text{F}_2(\text{g}) \rightarrow 2\text{AlF}_3(\text{aq}) + 3\text{Br}_2(\text{l})$
15.  $\text{Cu}(\text{ClO}_3)_2(\text{aq}) + \text{Mg}(\text{s}) \rightarrow \text{Mg}(\text{ClO}_3)_2(\text{aq}) + \text{Cu}(\text{s})$
16.  $2\text{H}_2\text{O}(\text{l}) + 2\text{Li}(\text{s}) \rightarrow 2\text{LiOH}(\text{aq}) + \text{H}_2(\text{g})$
17.  $\text{H}_2\text{SO}_4(\text{aq}) + \text{Ni}(\text{s}) \rightarrow \text{NiSO}_4(\text{aq}) + \text{H}_2(\text{g})$
18.  $\text{CaI}_2(\text{aq}) + \text{Cl}_2(\text{g}) \rightarrow \text{CaCl}_2(\text{aq}) + \text{I}_2(\text{s})$
19.  $6\text{HCl}(\text{aq}) + 2\text{Al}(\text{s}) \rightarrow 2\text{AlCl}_3(\text{aq}) + 3\text{H}_2(\text{g})$

### **Ionic Reactions ( D.D)**

1.  $\text{AgNO}_3(\text{aq}) + \text{NaCl}(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{NaNO}_3(\text{aq})$
2.  $\text{CuSO}_4(\text{aq}) + 2\text{KOH}(\text{aq}) \rightarrow \text{Cu}(\text{OH})_2(\text{s}) + \text{K}_2\text{SO}_4(\text{aq})$
3.  $3\text{CuCl}_2(\text{aq}) + 2\text{Na}_3\text{PO}_4(\text{aq}) \rightarrow \text{Cu}_3(\text{PO}_4)_2(\text{aq}) + 6\text{NaCl}(\text{aq})$
4.  $(\text{NH}_4)_2\text{S}(\text{aq}) + \text{Ba}(\text{NO}_3)_2(\text{aq}) \rightarrow \text{BaS}(\text{s}) + 2\text{NH}_4\text{NO}_3(\text{aq})$

5.  $\text{K}_2\text{SO}_4 \text{ (aq)} + \text{NaCl} \text{ (aq)} \rightarrow \text{N.R.}$
6.  $\text{Ba}(\text{NO}_3)_2 \text{ (aq)} + \text{CuSO}_4 \text{ (aq)} \rightarrow \text{BaSO}_4 \text{ (s)} + \text{Cu}(\text{NO}_3)_2 \text{ (aq)}$
7.  $\text{Na}_2\text{CO}_3 \text{ (aq)} + 2\text{HCl} \text{ (aq)} \rightarrow \text{N.R.}$   $\text{H}_2\text{CO}_3 \text{ (aq)} + 2\text{NaCl} \text{ (aq)}$  weaker acid will form
8.  $(\text{NH}_4)_2\text{S} \text{ (aq)} + \text{NaOH} \text{ (aq)} \rightarrow \text{NH}_4\text{OH} \text{ (aq)} + \text{Na}_2\text{S} \text{ (aq)}$  Weaker base forms
9.  $\text{LiSO}_3 \text{ (aq)} + \text{HCl} \text{ (aq)} \rightarrow \text{LiCl} \text{ (aq)} + \text{H}_2\text{SO}_3 \text{ (aq)}$  Weaker acid
10.  $(\text{NH}_4)_2\text{CuO}_4 \text{ (aq)} + \text{K}_2\text{CO}_3 \text{ (aq)} \rightarrow \text{N.R.}$
11.  $\text{Mg}(\text{OH})_2 \text{ (aq)} + \text{H}_2\text{SO}_4 \text{ (aq)} \rightarrow 2\text{H}_2\text{O} \text{ (l)} + \text{MgSO}_4 \text{ (aq)}$  Neutralization reaction
12.  $2\text{H}_3\text{PO}_4 \text{ (aq)} + 3\text{Ca}(\text{OH})_2 \text{ (aq)} \rightarrow 6\text{H}_2\text{O(l)} + \text{Ca}_3(\text{PO}_4)_2 \text{ (s)}$  Neutralization and PPT
13.  $2\text{AlBr}_3 \text{ (aq)} + 3\text{Pb}(\text{NO}_3)_2 \text{ (aq)} \rightarrow 3\text{PbBr}_2 \text{ (s)} + 2\text{Al}(\text{NO}_3)_3 \text{ (aq)}$
14.  $\text{Mg}(\text{C}_2\text{H}_3\text{O}_2)_2 \text{ (aq)} + \text{K}_2\text{CO}_3 \text{ (aq)} \rightarrow \text{MgCO}_3 \text{ (s)} + 2\text{KC}_2\text{H}_3\text{O}_2 \text{ (aq)}$
15.  $\text{CuCO}_3 \text{ (s)} + \text{HC}_2\text{H}_3\text{O}_2 \text{ (aq)} \rightarrow \text{H}_2\text{CO}_3 \text{ (aq)} + \text{Cu}(\text{C}_2\text{H}_3\text{O}_2)_2 \text{ (aq)}$
16.  $\text{H}_2\text{S} \text{ (aq)} + \text{Pb}(\text{NO}_3)_2 \text{ (aq)} \rightarrow \text{PbS} \text{ (s)} + 2\text{HNO}_3 \text{ (aq)}$
17.  $\text{BaCl}_2 \text{ (aq)} + \text{NaBr} \text{ (aq)} \rightarrow \text{N.R.}$
18.  $3\text{K}_2\text{CrO}_4 \text{ (aq)} + 2\text{AL}(\text{ClO}_3)_3 \text{ (aq)} \rightarrow \text{Al}_2(\text{CrO}_4)_3 \text{ (s)} + 6\text{KClO}_3 \text{ (aq)}$