

## CHEMISTRY

## Balancing Chemical Equations I

- 1)  $\underline{2}$  Al +  $\underline{3}$  S  $\longrightarrow$   $\underline{1}$  Al<sub>2</sub>S<sub>3</sub>
- 2)  $\underline{2}$  Zn +  $\underline{1}$  O<sub>2</sub>  $\longrightarrow$   $\underline{2}$  ZnO
- 3)  $\underline{1}$  Mg +  $\underline{1}$  Cl<sub>2</sub>  $\longrightarrow$   $\underline{1}$  MgCl<sub>2</sub>
- 4)  $\underline{4}$  Al +  $\underline{3}$  O<sub>2</sub>  $\longrightarrow$   $\underline{2}$  Al<sub>2</sub>O<sub>3</sub>
- 5)  $\underline{4}$  P +  $\underline{5}$  O<sub>2</sub>  $\longrightarrow$   $\underline{1}$  P<sub>4</sub>O<sub>10</sub>
- 6)  $\underline{2}$  Bi +  $\underline{3}$  Cl<sub>2</sub>  $\longrightarrow$   $\underline{2}$  BiCl<sub>3</sub>
- 7)  $\underline{1}$  H<sub>2</sub> +  $\underline{3}$  N<sub>2</sub>  $\longrightarrow$   $\underline{2}$  NH<sub>3</sub>
- 8)  $\underline{4}$  Cu +  $\underline{1}$  O<sub>2</sub>  $\longrightarrow$   $\underline{2}$  Cu<sub>2</sub>O
- 9)  $\underline{1}$  Sn +  $\underline{2}$  Cl<sub>2</sub>  $\longrightarrow$   $\underline{1}$  SnCl<sub>4</sub>
- 10)  $\underline{2}$  Na +  $\underline{1}$  S  $\longrightarrow$   $\underline{1}$  Na<sub>2</sub>S
- 11)  $\underline{2}$  Ag +  $\underline{1}$  I<sub>2</sub>  $\longrightarrow$   $\underline{2}$  AgI
- 12)  $\underline{2}$  Pb +  $\underline{1}$  O<sub>2</sub>  $\longrightarrow$   $\underline{2}$  PbO
- 13)  $\underline{2}$  Al +  $\underline{3}$  Br<sub>2</sub>  $\longrightarrow$   $\underline{2}$  AlBr<sub>3</sub>
- 14)  $\underline{2}$  Fe +  $\underline{3}$  F<sub>2</sub>  $\longrightarrow$   $\underline{2}$  FeF<sub>3</sub>
- 15)  $\underline{2}$  Sn +  $\underline{1}$  O<sub>2</sub>  $\longrightarrow$   $\underline{2}$  SnO
- 16)  $\underline{2}$  Sb +  $\underline{3}$  S  $\longrightarrow$   $\underline{1}$  Sb<sub>2</sub>S<sub>3</sub>
- 17)  $\underline{2}$  Ca +  $\underline{1}$  O<sub>2</sub>  $\longrightarrow$   $\underline{2}$  CaO
- 18)  $\underline{2}$  Ba +  $\underline{1}$  O<sub>2</sub>  $\longrightarrow$   $\underline{2}$  BaO
- 19)  $\underline{3}$  Mg +  $\underline{2}$  P  $\longrightarrow$   $\underline{1}$  Mg<sub>3</sub>P<sub>2</sub>
- 20)  $\underline{6}$  K +  $\underline{1}$  N<sub>2</sub>  $\longrightarrow$   $\underline{2}$  K<sub>3</sub>N

## CHEMISTRY

## BALANCING CHEMICAL EQUATIONS PRACT. II

- 1)  $\underline{1}$  Zn +  $\underline{2}$  HCl  $\longrightarrow$   $\underline{1}$  ZnCl<sub>2</sub> +  $\underline{1}$  H<sub>2</sub>
- 2)  $\underline{1}$  NH<sub>3</sub> +  $\underline{1}$  HCl  $\longrightarrow$   $\underline{1}$  NH<sub>4</sub>Cl
- 3)  $\underline{2}$  Al +  $\underline{6}$  HCl  $\longrightarrow$   $\underline{2}$  AlCl<sub>3</sub> +  $\underline{3}$  H<sub>2</sub>
- 4)  $\underline{3}$  Mg +  $\underline{2}$  H<sub>3</sub>PO<sub>4</sub>  $\longrightarrow$   $\underline{1}$  Mg<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> +  $\underline{3}$  H<sub>2</sub>
- 5)  $\underline{1}$  Cu +  $\underline{2}$  AgNO<sub>3</sub>  $\longrightarrow$   $\underline{1}$  Cu(NO<sub>3</sub>)<sub>2</sub> +  $\underline{2}$  Ag
- 6)  $\underline{1}$  Ca +  $\underline{1}$  Pb(NO<sub>3</sub>)<sub>2</sub>  $\longrightarrow$   $\underline{1}$  Pb +  $\underline{1}$  Ca(NO<sub>3</sub>)<sub>2</sub>
- 7)  $\underline{2}$  Al +  $\underline{3}$  Pb(NO<sub>3</sub>)<sub>2</sub>  $\longrightarrow$   $\underline{3}$  Pb +  $\underline{2}$  Al(NO<sub>3</sub>)<sub>3</sub>
- 8)  $\underline{2}$  Zn +  $\underline{1}$  Sn(NO<sub>3</sub>)<sub>4</sub>  $\longrightarrow$   $\underline{2}$  Zn(NO<sub>3</sub>)<sub>2</sub> +  $\underline{1}$  Sn
- 9)  $\underline{3}$  Cl<sub>2</sub> +  $\underline{2}$  AlI<sub>3</sub>  $\longrightarrow$   $\underline{2}$  AlCl<sub>3</sub> +  $\underline{3}$  I<sub>2</sub>
- 10)  $\underline{1}$  Br<sub>2</sub> +  $\underline{2}$  CuI  $\longrightarrow$   $\underline{2}$  CuBr +  $\underline{1}$  I<sub>2</sub>
- 11)  $\underline{3}$  NH<sub>4</sub>OH +  $\underline{1}$  FeCl<sub>3</sub>  $\longrightarrow$   $\underline{3}$  NH<sub>4</sub>Cl +  $\underline{1}$  Fe(OH)<sub>3</sub>
- 12)  $\underline{2}$  KBr +  $\underline{1}$  Pb(NO<sub>3</sub>)<sub>2</sub>  $\longrightarrow$   $\underline{2}$  KNO<sub>3</sub> +  $\underline{1}$  PbBr<sub>2</sub>
- 13)  $\underline{2}$  AlCl<sub>3</sub> +  $\underline{3}$  H<sub>2</sub>SO<sub>4</sub>  $\longrightarrow$   $\underline{1}$  Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> +  $\underline{6}$  HCl
- 14)  $\underline{1}$  Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> +  $\underline{3}$  BaCl<sub>2</sub>  $\longrightarrow$   $\underline{3}$  BaSO<sub>4</sub> +  $\underline{2}$  AlCl<sub>3</sub>
- 15)  $\underline{1}$  Na<sub>2</sub>CO<sub>3</sub> +  $\underline{1}$  CaCl<sub>2</sub>  $\longrightarrow$   $\underline{1}$  CaCO<sub>3</sub> +  $\underline{2}$  NaCl
- 16)  $\underline{3}$  H<sub>2</sub>SO<sub>4</sub> +  $\underline{2}$  AlBr<sub>3</sub>  $\longrightarrow$   $\underline{6}$  HBr +  $\underline{1}$  Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>
- 17)  $\underline{2}$  Na<sub>3</sub>PO<sub>4</sub> +  $\underline{3}$  BaCl<sub>2</sub>  $\longrightarrow$   $\underline{1}$  Ba<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> +  $\underline{6}$  NaCl
- 18)  $\underline{2}$  K<sub>3</sub>PO<sub>4</sub> +  $\underline{3}$  MgSO<sub>4</sub>  $\longrightarrow$   $\underline{1}$  Mg<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> +  $\underline{3}$  K<sub>2</sub>SO<sub>4</sub>
- 19)  $\underline{2}$  NaOH +  $\underline{1}$  CuSO<sub>4</sub>  $\longrightarrow$   $\underline{1}$  Na<sub>2</sub>SO<sub>4</sub> +  $\underline{1}$  Cu(OH)<sub>2</sub>
- 20)  $\underline{1}$  Mg(OH)<sub>2</sub> +  $\underline{1}$  H<sub>2</sub>SO<sub>4</sub>  $\longrightarrow$   $\underline{1}$  MgSO<sub>4</sub> +  $\underline{2}$  H<sub>2</sub>O

## CHEMISTRY

## BALANCING CHEMICAL EQUATIONS PRACTICE III

- 1)  $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
- 2)  $\text{S}_8 + 12\text{O}_2 \rightarrow 8\text{SO}_3$
- 3)  $2\text{HgO} \rightarrow 2\text{Hg} + \text{O}_2$
- 4)  $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$
- 5)  $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$
- 6)  $\text{C}_{10}\text{H}_{16} + 8\text{Cl}_2 \rightarrow 10\text{C} + 16\text{HCl}$
- 7)  $4\text{Si}_2\text{H}_3 + 11\text{O}_2 \rightarrow 8\text{SiO}_2 + 6\text{H}_2\text{O}$
- 8)  $4\text{Fe} + 3\text{O}_2 \rightarrow 2\text{Fe}_2\text{O}_3$
- 9)  $2\text{C}_7\text{H}_6\text{O}_2 + 15\text{O}_2 \rightarrow 14\text{CO}_2 + 6\text{H}_2\text{O}$
- 10)  $4\text{FeS}_2 + 11\text{O}_2 \rightarrow 2\text{Fe}_2\text{O}_3 + 8\text{SO}_2$
- 11)  $\text{Fe}_2\text{O}_3 + 3\text{H}_2 \rightarrow 2\text{Fe} + 3\text{H}_2\text{O}$
- 12)  $2\text{K} + \text{Br}_2 \rightarrow 2\text{KBr}$
- 13)  $2\text{C}_2\text{H}_2 + 5\text{O}_2 \rightarrow 4\text{CO}_2 + 2\text{H}_2\text{O}$
- 14)  $2\text{H}_2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{O}_2$
- 15)  $\text{C}_7\text{H}_{16} + 11\text{O}_2 \rightarrow 7\text{CO}_2 + 8\text{H}_2\text{O}$
- 16)  $\text{SiO}_2 + 4\text{HF} \rightarrow \text{SiF}_4 + 2\text{H}_2\text{O}$
- 17)  $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$
- 18)  $4\text{KClO}_3 \rightarrow 3\text{KClO}_4 + \text{KCl}$
- 19)  $\text{P}_4\text{O}_{10} + 6\text{H}_2\text{O} \rightarrow 4\text{H}_3\text{PO}_4$
- 20)  $4\text{Sb} + 3\text{O}_2 \rightarrow \text{Sb}_4\text{O}_6$
- 21)  $\text{C}_3\text{H}_8 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$
- 22)  $1\text{Fe}_2\text{O}_3 + 2\text{CO} \rightarrow 2\text{Fe} + \text{CO}_2$
- 23)  $\text{PCl}_5 + 4\text{H}_2\text{O} \rightarrow 5\text{HCl} + \text{H}_3\text{PO}_4$
- 24)  $8\text{H}_2\text{S} + 8\text{Cl}_2 \rightarrow \text{S}_8 + 16\text{HCl}$
- 25)  $3\text{Fe} + 4\text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$
- 26)  $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$
- 27)  $2\text{N}_2 + \text{O}_2 \rightarrow 2\text{N}_2\text{O}$
- 28)  $6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 3\text{O}_2$
- 29)  $\text{SiCl}_4 + 4\text{H}_2\text{O} \rightarrow \text{H}_4\text{SiO}_4 + 4\text{HCl}$
- 30)  $2\text{H}_3\text{PO}_4 \rightarrow \text{H}_4\text{P}_2\text{O}_7 + \text{H}_2\text{O}$
- 31)  $\text{CO}_2 + 2\text{NH}_3 \rightarrow \text{OC}(\text{NH}_2)_2 + \text{H}_2\text{O}$
- 32)  $2\text{Al}(\text{OH})_3 + 3\text{H}_2\text{SO}_4 \rightarrow \text{Al}_2(\text{SO}_4)_3 + 3\text{H}_2\text{O}$
- 33)  $\text{Fe}_2(\text{SO}_4)_3 + 6\text{KOH} \rightarrow 3\text{K}_2\text{SO}_4 + 2\text{Fe}(\text{OH})_3$
- 34)  $\text{H}_2\text{SO}_4 + 8\text{HI} \rightarrow \text{H}_2\text{S} + 4\text{I}_2 + 4\text{H}_2\text{O}$
- 35)  $2\text{Al} + 3\text{FeO} \rightarrow \text{Al}_2\text{O}_3 + 3\text{Fe}$
- 36)  $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$
- 37)  $\text{P}_4 + 5\text{O}_2 \rightarrow 2\text{P}_2\text{O}_5$
- 38)  $\text{K}_2\text{O} + \text{H}_2\text{O} \rightarrow 2\text{KOH}$
- 39)  $4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$
- 40)  $2\text{Na}_2\text{O}_2 + 2\text{H}_2\text{O} \rightarrow 4\text{NaOH} + \text{O}_2$
- 41)  $\text{C} + \text{H}_2\text{O} \rightarrow \text{CO} + \text{H}_2$  *balanced.*
- 42)  $2\text{H}_3\text{AsO}_4 \rightarrow \text{As}_2\text{O}_5 + 3\text{H}_2\text{O}$
- 43)  $\text{Al}_2(\text{SO}_4)_3 + 3\text{Ca}(\text{OH})_2 \rightarrow 2\text{Al}(\text{OH})_3 + 3\text{CaSO}_4$
- 44)  $\text{FeCl}_3 + 3\text{NH}_4\text{OH} \rightarrow \text{Fe}(\text{OH})_3 + 3\text{NH}_4\text{Cl}$
- 45)  $2\text{Ca}_3(\text{PO}_4)_2 + 6\text{SiO}_2 \rightarrow \text{P}_4\text{O}_{10} + 6\text{CaSiO}_3$
- 46)  $\text{N}_2\text{O}_5 + \text{H}_2\text{O} \rightarrow 2\text{HNO}_3$
- 47)  $2\text{Al} + 6\text{HCl} \rightarrow 2\text{AlCl}_3 + 3\text{H}_2$
- 48)  $6\text{H}_3\text{BO}_3 \rightarrow \text{H}_4\text{B}_6\text{O}_{11} + 7\text{H}_2\text{O}$
- 49)  $3\text{Mg} + \text{N}_2 \rightarrow \text{Mg}_3\text{N}_2$
- 50)  $2\text{NaOH} + \text{Cl}_2 \rightarrow \text{NaCl} + \text{NaClO} + \text{H}_2\text{O}$

**CHEMISTRY****Balancing Chemical Word Equations II**

Write a balanced chemical equation in the box below the following word equations:

1. potassium chloride + silver nitrate -----> potassium nitrate + silver chloride



2. aluminum hydroxide + sodium nitrate -----> aluminum nitrate + sodium hydroxide



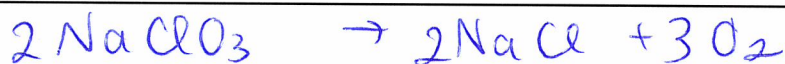
3. iron metal + copper II sulfate -----> iron II sulfate + copper metal



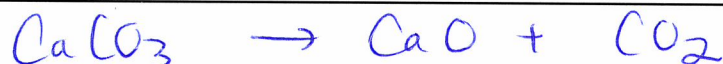
4. aluminum metal + cupric chloride -----> aluminum chloride + copper metal



5. sodium chlorate -----> sodium chloride + oxygen gas



6. calcium carbonate -----> calcium oxide + carbon dioxide gas



7. zinc metal + oxygen gas -----> zinc oxide



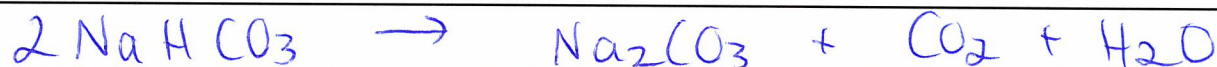
8. chlorine gas + sodium metal -----> sodium chloride



9. aluminum sulfate + barium chloride -----> aluminum chloride + barium sulfate



10. sodium hydrogen carbonate -----> sodium carbonate + carbon dioxide gas + water



**CHEMISTRY****Balancing Chemical Word Equations III**

Write a balanced chemical equation in the box below the following word equations:

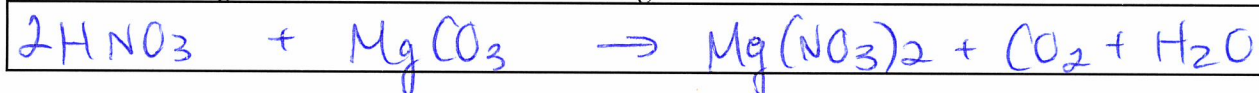
1. aluminum permanganate + ammonium acetate -----> ammonium permanganate + aluminum acetate



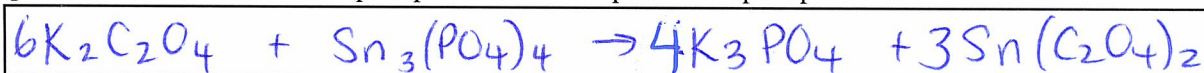
2. sodium + water -----> sodium hydroxide + hydrogen



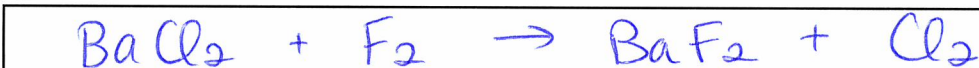
3. nitric acid + magnesium carbonate -----> magnesium nitrate + carbon dioxide + water



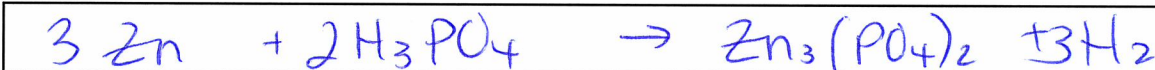
4. potassium oxalate + tin IV phosphate -----> potassium phosphate + tin IV oxalate



5. barium chloride + fluorine -----> barium fluoride + chlorine



6. zinc + phosphoric acid -----> zinc phosphate + hydrogen



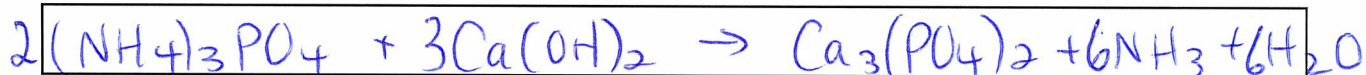
7. lead IV sulfide + oxygen -----> lead IV oxide + sulfur dioxide



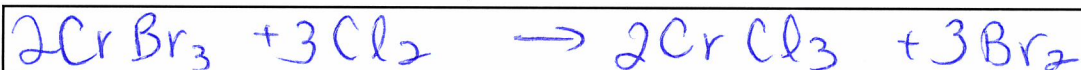
8. ferric iodide + cuprous hydrogen carbonate -----> ferric hydrogen carbonate + cuprous iodide



9. ammonium phosphate + calcium hydroxide -----> calcium phosphate + ammonia + water



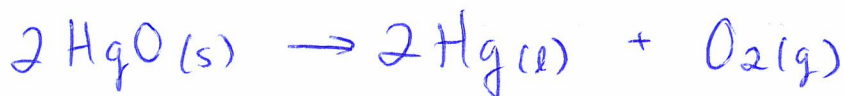
10. chromium III bromide + chlorine -----> chromium III chloride + bromine



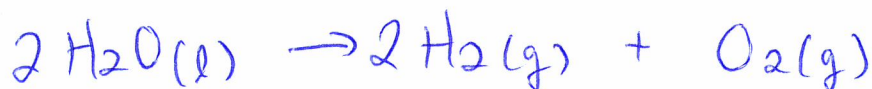


Write balanced chemical equations for the reactions described below:

1. Solid mercury (II) oxide is heated to produce liquid mercury and oxygen gas.



2. Water decomposes with electricity to produce both hydrogen and oxygen gases.



3. Solid tetraphosphorus decoxide reacts with water to produce phosphoric acid.



4. Sodium hydroxide reacts with nitric acid in solution to produce sodium nitrate and water.



5. When metallic iron is mixed with hydrochloric acid, aqueous iron III chloride and hydrogen gas are produced.



6. Silver oxide can be heated to give silver metal and oxygen gas as products.



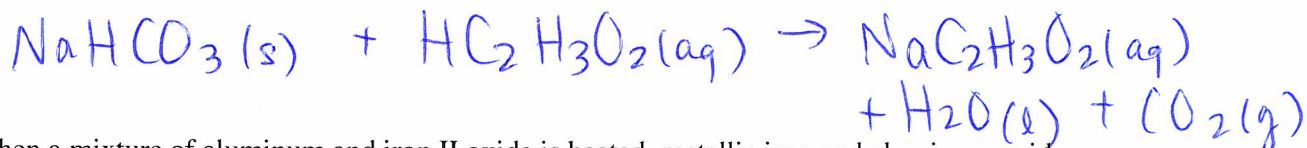
7. When sodium metal is dropped into water, and aqueous solution of sodium hydroxide, and hydrogen are produced.



8. Heating aqueous sulfuric acid produces water, and oxygen and sulfur dioxide gases.



9. Sodium hydrogen carbonate reacts with acetic acid to produce sodium acetate, water, and carbon dioxide.



10. When a mixture of aluminum and iron II oxide is heated, metallic iron and aluminum oxide are produced.

