

Name \_\_\_\_\_  
**Reactions Mix 1**

Redox --  $A + BC \rightarrow AC + B$   
 Solubility --  $AB + CD \rightarrow AD + CB$   
 Composition --  $A + B \rightarrow AB$  (redox)  
 Decomposition --  $AB \rightarrow A + B$  (redox)  
 Neutralization -- Acid + base  $\rightarrow$  Salt + HOH  
 Combustion --  $C_xH_y + O_2 \rightarrow H_2O + CO_2$  (redox)

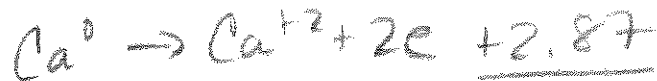
\*For Decomposition reactions decompose to elements.

Complete and balance	Reaction Type
1. <u>2</u> H <sub>2</sub> + <u>1</u> O <sub>2</sub> $\rightarrow$ 2H <sub>2</sub> O	(redox) decomposition
2. <u>1</u> Acetic acid + <u>1</u> NaOH $\rightarrow$ $HC_2H_3O_2 + NaOH \rightarrow H_2O + NaC_2H_3O_2$	neutralization
3. <u>1</u> H <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> + <u>1</u> K <sub>2</sub> CO <sub>3</sub> $\rightarrow$ H <sub>2</sub> CO <sub>3</sub> + K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> <small>(H<sub>2</sub>O + CO<sub>2</sub> (g)) (aq)</small>	solubility
4. <u>1</u> Zn + <u>1</u> S $\rightarrow$ ZnS	(redox) composition
5. <u>1</u> Al + <u>3</u> AgNO <sub>3</sub> $\rightarrow$ Al(NO <sub>3</sub> ) <sub>3</sub> + 3Ag <small>+1.66 + 0.80 = 2.46V</small>	Redox spontaneous
6. <u>2</u> NH <sub>3</sub> $\rightarrow$ N <sub>2</sub> + 3H <sub>2</sub>	(redox) decomposition
7. <u>1</u> H <sub>2</sub> CO <sub>3</sub> + <u>1</u> MgCl <sub>2</sub> $\rightarrow$ 2HCl + MgCO <sub>3</sub> <small>(aq) (s)</small>	solubility
8. <u>4</u> K + <u>1</u> H <sub>2</sub> O <sub>2</sub> $\rightarrow$ 2K <sub>2</sub> O + H <sub>2</sub> <small>+2.92 + 0 = +2.92V</small>	redox spontaneous
9. <u>2</u> Fe + <u>1</u> O <sub>2</sub> $\rightarrow$ 2FeO	composition (redox)
10. <u>2</u> NaCl $\rightarrow$ 2Na + Cl <sub>2</sub> <small>non spont.</small>	decomposition (redox)
11. <u>2</u> Ba + <u>1</u> Sn(NO <sub>3</sub> ) <sub>4</sub> $\rightarrow$ 2Ba(NO <sub>3</sub> ) <sub>2</sub> + Sn <small>+2.90 + 0.15 = +3.05V</small>	redox spontaneous
12. <u>2</u> NI <sub>3</sub> $\rightarrow$ N <sub>2</sub> + 3I <sub>2</sub>	decomposition (redox)
13. <u>2</u> Potassium cyanide + <u>1</u> Sulfuric acid $\rightarrow$ $2KCN + H_2SO_4 \rightarrow K_2SO_4 + 2HCN$	solubility
14. <u>2</u> NaCl + <u>1</u> F <sub>2</sub> $\rightarrow$ 2NaF + Cl <sub>2</sub> <small>+2.87 + -1.36 = +1.51V</small>	Redox spontaneous

hydrogen peroxide  
 $H^{+1} O_2^{-2}$

15. <u>3</u> $H_2O_2$ + <u>4</u> $Al \rightarrow 2Al_2O_3 + 3H_2$	Redox
16. _____ Acetic acid + _____ Sodium bicarbonate $\rightarrow$ $HC_2H_3O_2 + NaHCO_3 \rightarrow H_2CO_3 + NaC_2H_3O_2$	
17. _____ Iron + _____ Nitric acid $\rightarrow$ $Fe + 2HNO_3 \rightarrow Fe(NO_3)_2 + H_2$ ( $H_2O$ and $CO_2$ )	Redox - spont.
18. _____ Sulfur + _____ Copper $\rightarrow$ $S + Cu \rightarrow CuS$	composition (Redox)
19. <u>2</u> $CH_4 \rightarrow 2C + H_2$	decomposition Redox
20. _____ Lead (IV) sulfate + _____ Ca $\rightarrow 2CaSO_4 + Pb$ $Pb(SO_4)_2 + 2Ca \rightarrow$	Redox

+44  
 $\frac{00}{1.44}$



+2.74

spontaneous

Name  
Reactions Mix 2

Redox -- $A + BC \rightarrow AC + B$
Solubility -- $AB + CD \rightarrow AD + CB$
Composition -- $A + B \rightarrow AB$
Decomposition -- $AB \rightarrow A + B$
Neutralization -- Acid + base $\rightarrow$ Salt + HOH
Combustion -- $C_xH_y + O_2 \rightarrow H_2O + CO_2$

\*For Decomposition reactions decompose to elements.

Complete and balance	Reaction Type
1. $2 \text{Na} + \text{Cl}_2 \rightarrow 2 \text{NaCl}$ $2 \text{Na}^0 \rightarrow 2 \text{Na}^+ + 2e^-$ +2.71 $2e^- + \text{Cl}_2^0 \rightarrow 2 \text{Cl}^-$ +1.36 +V spont.	composition redox spontaneous
2. $2 \text{NaF} + \text{I}_2 \rightarrow 2 \text{NaI} + \text{F}_2$ $2 \text{F}^- \rightarrow \text{F}_2 + 2e^-$ -2.87 $2e^- + \text{I}_2 \rightarrow 2 \text{I}^-$ 0.53 } -2.34V	redox nonspont.
3. $2 \text{K}_3\text{PO}_4 + 3 \text{Pb}(\text{NO}_3)_2 \rightarrow 6 \text{KNO}_3 + \text{Pb}_3(\text{PO}_4)_2(\text{s})$ <small>(aq) (s)</small>	solubility
4. $\text{HCl} + \text{NH}_4\text{OH} \rightarrow \text{HOH}(\text{l}) + \text{NH}_4\text{Cl}(\text{aq})$ $\text{H}^+ + \text{OH}^- \rightarrow \text{HOH}(\text{l})$	neutralization
5. Phosphoric acid + Sodium $\rightarrow$ $2 \text{H}_3\text{PO}_4 + 6 \text{Na} \rightarrow 2 \text{Na}_3\text{PO}_4 + 3 \text{H}_2$ 0.00 $6 \text{Na}^0 \rightarrow 6 \text{Na}^+ + 6e^-$ +2.71	redox spontaneous
6. Hydrobromic acid + Aluminum hydroxide $\rightarrow$ $3 \text{HBr} + \text{Al}(\text{OH})_3 \rightarrow 3 \text{HOH}(\text{l}) + \text{AlBr}_3$ $3 \text{H}^+ + 3 \text{OH}^- \rightarrow 3 \text{HOH}(\text{l})$	solubility neutralization
7. $2 \text{Mg} + \text{O}_2 \rightarrow 2 \text{MgO}$ $\text{Mg}^0 \rightarrow 2 \text{Mg}^{+2} + 2e^-$ +2.37 $2e^- + \text{O}_2 \rightarrow 2 \text{O}^{2-}$ (no value)	composition (redox)
8. Sulfuric acid + Barium Nitrate $\rightarrow$ $\text{H}_2\text{SO}_4 + \text{Ba}(\text{NO}_3)_2 \rightarrow 2 \text{HNO}_3 + \text{BaSO}_4$ <small>(aq) (s)</small>	solubility
9. $2 \text{O}_3 \rightarrow 3 \text{O}_2$	decomp/comp.
10. $\text{K}_3\text{N} + 3 \text{Li} \rightarrow \text{Li}_3\text{N} + 3 \text{K}$ $3 \text{Li}^0 \rightarrow 3 \text{Li}^+ + 3e^-$ 3.05 $3e^- + 3 \text{K}^+ \rightarrow 3 \text{K}^0$ -2.92 <small>76</small> 0.13V	redox spontaneous

11. _____ Gold(III) Chloride + _____ Potassium cyanide → $AuCl_3 + 3KCN \rightarrow Au(CN)_3 + 3KCl(aq)$ ↑ probably (s)	solubility
<del>12.</del> _____ Gold + Silic acid →	
13. _____ Lithium + _____ Aluminum Sulfate → $6Li + Al_2(SO_4)_3 \rightarrow 3Li_2SO_4 + 2Al$ -3.05 + 1.66 = -1.39V nonspont.	redox
14. _____ $CaCl_2$ + _____ $Na_2CO_3$ → $CaCO_3(s) + 2NaCl(aq)$	solubility
15. _____ $CaCl_2$ + _____ $F_2$ → $CaF_2 + Cl_2$ 2.87 + 1.51V -1.36V spontaneous	redox
16. Silver Nitrate + Iron (III) Chloride → $3AgNO_3 + FeCl_3 \rightarrow 3AgCl(s) + Fe(NO_3)_3(aq)$	solubility
17. Ammonium Nitrate + $PbI_4$ → $NH_4NO_3(aq) + PbI_4 \rightarrow NH_4I(aq) + Pb(NO_3)_4(aq)$	solubility NO RXN
18. <u>2</u> Al + <u>3</u> $Br_2$ → $2AlBr_3$ spontaneous +1.66 + +1.07	redox composition
19. <u>3</u> Zn + _____ $N_2$ → $Zn_3N_2$ +0.716 + value	redox composition