Chem ch 6
wkst 10 K

1)

Na	23.0g	x1 =	23.0g
H	1.0g	x1 =	1.0g
C	12.0g	x1 =	12.0g
O	16.0g	x3 =	48.0g
			84.0g $NaHCO_3$

$\frac{23.0g\ Na}{84.0g\ NaHCO_3} \times 100\% = \boxed{27.4\%\ Na}$

$\frac{1.0g\ H}{84.0g\ NaHCO_3} \times 100\% = \boxed{1.2\%\ H}$

$\frac{12.0g\ C}{84.0g\ NaHCO_3} \times 100\% = \boxed{14.3\%\ C}$

$\frac{48.0g\ O}{84.0g\ NaHCO_3} \times 100\% = \boxed{57.1\%\ O}$

2) A) $Ca(NO_3)_2$

1mole = 164.1g $Ca(NO_3)_2$

$\frac{28.0g\ N}{164.1g\ Ca(NO_3)_2} \times 100\% = 17.1\%\ N$

B) $AgNO_3$

1mole = 169.9g $AgNO_3$

$\frac{14.0g\ N}{169.9g\ AgNO_3} \times 100\% = 8.24\%\ N$

C) $\boxed{(NH_4)_2SO_4}$

1mole = 132.1g $(NH_4)_2SO_4$

$\frac{28.0g\ N}{132.1g\ (NH_4)_2SO_4} \times 100\% = \boxed{21.2\%\ N}$

3) ? % CaO in $CaCO_3$

1mole $CaCO_3$ = 100.1g $CaCO_3$

$\frac{56.1g\ CaO}{100.1g\ CaCO_3} \times 100\% = 56.0\%\ CaO$

4) ?% composition of $C_{11}H_{12}N_2O_5Cl_2$

C	12.0g x 11	=	132.0g C
H	1.0g x 12	=	12.0g H
N	14.0g x 2	=	28.0g N
O	16.0g x 5	=	80.0g O
Cl	35.5g x 2	=	71.0g Cl

323.0g $C_{11}H_{12}N_2O_5Cl_2$

$\frac{132.0g\ C}{323.0g\ C_{11}H_{12}N_2O_5Cl_2} \times 100\% =$ **40.87 % C**

$\frac{12.0g\ H}{323.0g\ C_{11}H_{12}N_2O_5Cl_2} \times 100\% =$ **3.72% H**

$\frac{28.0g\ N}{323.0g\ C_{11}H_{12}N_2O_5Cl_2} \times 100\% =$ **8.67% N**

$\frac{80.0g\ O}{323.0g\ C_{11}H_{12}N_2O_5Cl_2} \times 100\% =$ **24.8 % O**

$\frac{71.0g\ Cl}{323.0g\ C_{11}H_{12}N_2O_5Cl_2} \times 100\% =$ **22.0% Cl**

5) ?% H_2O in $CuSO_4 \cdot 5H_2O$

Cu	63.5g x 1	=	63.5g Cu
S	32.1g x 1	=	32.1g S
O	16.0g x 4	=	64.0g O
H	1.0g x 10	=	10.0g H
O	16.0g x 5	=	80.0g O

249.6g $CuSO_4 \cdot 5H_2O$

$\frac{90.0g\ H_2O}{249.6g\ CuSO_4 \cdot 5H_2O} \times 100\% =$ **36.1% H_2O**

6) ? Empirical formula Silver Fluoride

$\left(\frac{85.0g\ Ag}{1}\right)\left(\frac{1\ mole\ Ag}{107.9g\ Ag}\right) = .787$ mole Ag $\qquad \frac{.787}{.787} = 1$ Ag

$\left(\frac{15.0g\ F}{1}\right)\left(\frac{1\ mole\ F}{19.0g\ F}\right) = .789$ mole F $\qquad \frac{.789}{.787} = 1$ F

∴ **AgF**

7) ? Empirical formula's for Platinum Chlorine

A) 42.1% Cl

$\left(\frac{42.1\text{g Cl}}{1}\right)\left(\frac{1\text{ mole Cl}}{35.5\text{g Cl}}\right) = 1.19\text{ mole Cl}$ $\qquad \frac{1.19}{.297} = 4.01\text{ Cl}$

$\left(\frac{57.9\text{g Pt}}{1}\right)\left(\frac{1\text{ mole Pt}}{195.1\text{g Pt}}\right) = .297\text{ mole Pt}$ $\qquad \frac{.297}{.297} = 1.00\text{ Pt}$

$\therefore$ $PtCl_4$

Platinum IV Chloride

B) 26.7% Cl

$\left(\frac{26.7\text{g Cl}}{1}\right)\left(\frac{1\text{ mole Cl}}{35.5\text{g Cl}}\right) = .752\text{ mole Cl}$ $\qquad \frac{.752}{.376} = 2.00\text{ Cl}$

$\left(\frac{73.3\text{g Pt}}{1}\right)\left(\frac{1\text{ mole Pt}}{195.1\text{g Pt}}\right) = .376\text{ mole Pt}$ $\qquad \frac{.376}{.376} = 1.00\text{ Pt}$

$\therefore$ $PtCl_2$

Platinum II chloride

8) ? empirical formula + name

$\left(\frac{24.58\text{g K}}{1}\right)\left(\frac{1\text{ mole K}}{39.1\text{g K}}\right) = .629\text{ mole K}$ $\qquad \frac{.629}{.629} = 1.00\text{ K}$

$\left(\frac{34.81\text{g Mn}}{1}\right)\left(\frac{1\text{ mole Mn}}{54.9\text{g Mn}}\right) = .634\text{ mole Mn}$ $\qquad \frac{.634}{.629} = 1.01\text{ Mn}$

$\left(\frac{40.52\text{g O}}{1}\right)\left(\frac{1\text{ mole O}}{16.0\text{g O}}\right) = 2.53\text{ mole O}$ $\qquad \frac{2.53}{.629} = 4.02\text{ O}$

$\therefore$ $KMnO_4$

Potassium Permanganate

9) ? Empirical formula + Name

$\left(\frac{48.2\text{g Fe}}{1}\right)\left(\frac{1\text{ mole Fe}}{55.8\text{g Fe}}\right) = .864\text{ mole Fe}$ $\quad \frac{.864}{.864} = 1.00\text{ Fe}$

$\left(\frac{10.4\text{g C}}{1}\right)\left(\frac{1\text{ mole C}}{12.0\text{g C}}\right) = .867\text{ mole C}$ $\quad \frac{.867}{.864} = 1.00\text{ C}$

$\left(\frac{41.4\text{g O}}{1}\right)\left(\frac{1\text{ mole O}}{16.0\text{g O}}\right) = 2.59\text{ mole O}$ $\quad \frac{2.59}{.864} = 3.00\text{ O}$

$\therefore$ $FeCO_3$

Iron II Carbonate

10) ? Empirical formula + NAme

$\left(\frac{15.8\text{g Al}}{1}\right)\left(\frac{1\text{ mole Al}}{27.0\text{g Al}}\right) = .585\text{ mole Al}$ $\quad \frac{.585}{.585} = 1.00\text{ Al}$

$\left(\frac{28.1\text{g S}}{1}\right)\left(\frac{1\text{ mole S}}{32.1\text{g S}}\right) = .875\text{ moles S}$ $\quad \frac{.875}{.585} = 1.50\text{ S}$

$\left(\frac{56.1\text{g O}}{1}\right)\left(\frac{1\text{ mole O}}{16.0\text{g O}}\right) = 3.51\text{ mole O}$ $\quad \frac{3.51}{.585} = 6.00\text{ O}$

$\therefore Al_2S_3O_{12}$

$Al_2(SO_4)_3$

Aluminum Sulfate