

1. (4 Pts) Complete the following chart, in order from left to right

Ion or Atom	Mass Number	Protons	Neutrons	Electrons
$^{40}\text{Ca}^{2+}$	40	20	20	18
I-129	129	53	76	53

2. (4 Pts) Determine the empirical formula of a compound of uranium and fluorine that is composed of 67.6% uranium and 32.4% fluorine. (U 238.0 F 19.0) see Quiz 2b

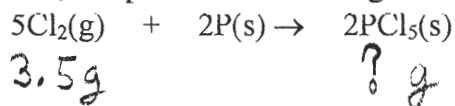
U:

U<sub>6</sub>F<sub>6</sub>

F

3. (2 Pts) What is the empirical formula for C<sub>6</sub>H<sub>14</sub>O? this is empirical formula.

4 (5 Pts) Chlorine gas reacts with phosphorus to produce phosphorus pentachloride. How many grams of PCl<sub>5</sub> are produced from 3.5 g of Cl<sub>2</sub> and excess P? (P 30.97 Cl 35.45)



$$\frac{3.5 \text{ g Cl}_2}{70.9 \text{ g Cl}_2} \times \frac{1 \text{ mol Cl}_2}{1 \text{ mol Cl}_2} \times \frac{2 \text{ mol PCl}_5}{5 \text{ mol Cl}_2} \times 208.22 \text{ g PCl}_5 = 4.19 \text{ g PCl}_5$$

5 (7 Pts) How many moles of sodium nitrate would be produced from the complete reaction of 3.5 moles of lead(II) nitrate with 4.8 moles of sodium chloride?



Based on NaCl;  $\frac{4.8 \text{ mol NaCl}}{2 \text{ mol NaCl}} \times 2 \text{ mol NaNO}_3 = 4.8 \text{ mol NaNO}_3$

Based on Pb(NO<sub>3</sub>)<sub>2</sub>;  $\frac{3.5 \text{ mol Pb}(\text{NO}_3)_2}{1 \text{ mol Pb}(\text{NO}_3)_2} \times 2 \text{ mol NaNO}_3 = 7.0 \text{ mol NaNO}_3$

6. (3 Pts) Calculate the molar mass of (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> (N 14.01, H 1.008, S 32.06, O 16.00)

$$\frac{132.14 \text{ g}}{\text{mol}}$$

1. (4 Pts) Complete the following chart, in order from left to right

Ion or Atom	Mass Number	Protons	Neutrons	Electrons
$^{24}\text{Mg}^{2+}$	24	12	12	10
I-127	127	53	74	53

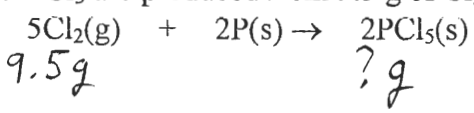
2. (4 Pts) Determine the empirical formula of a compound of uranium and fluorine that is composed of 67.6% uranium and 32.4% fluorine. (U 238.0 F 19.0)

U:  $\frac{67.6\text{g}}{238.0\text{g/mol}} = 0.284\text{mol} \div 0.284 = 1$  U<sub>1</sub>F<sub>6</sub>

F:  $\frac{32.4\text{g}}{19.0\text{g/mol}} = 1.71\text{mol} \div 0.284 = 6.0$

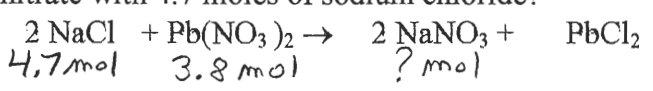
3. (2 Pts) What is the empirical formula for C<sub>6</sub>H<sub>14</sub>O? this is empirical formula

4 (5 Pts) Chlorine gas reacts with phosphorus to produce phosphorus pentachloride. How many grams of PCl<sub>5</sub> are produced from 9.5 g of Cl<sub>2</sub> and excess P? (P 30.97 Cl 35.45)



$\frac{9.5\text{g Cl}_2}{70.9\text{g Cl}_2} \times \frac{\cancel{\text{mol Cl}_2}}{\cancel{\text{mol Cl}_2}} \times \frac{2\text{mol PCl}_5}{5\cancel{\text{mol Cl}_2}} \times \frac{208.22\text{g PCl}_5}{\cancel{\text{mol PCl}_5}} = 11.2\text{g PCl}_5$

5 (7 Pts) How many moles of sodium nitrate would be produced from the complete reaction of 3.8 moles of lead(II) nitrate with 4.7 moles of sodium chloride?



Based on NaCl:  $\frac{4.7\text{mol NaCl}}{2\text{mol NaCl}} \times 2\text{mol NaNO}_3 = 4.7\text{mol NaNO}_3$

Based on Pb(NO<sub>3</sub>)<sub>2</sub>:  $\frac{3.8\text{mol Pb}(\text{NO}_3)_2}{1\text{mol Pb}(\text{NO}_3)_2} \times 2\text{mol NaNO}_3 = 7.6\text{mol NaNO}_3$

6. (3 Pts) Calculate the molar mass of (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> (N 14.01, H 1.008, S 32.06, O 16.00)

$2 \times 14.01$   
 $8 \times 1.008$   
 $1 \times 32.06$   
 $4 \times 16.00$   
132.14g/mol