Name: _____

Block: _____

Stoichiometry #2: Problems With Mole Conversions

1. In the chemical reaction:

$$2\,K + Cl_2 \longrightarrow 2\,KCl$$

How many *moles* of KCl (F.W. $74.55\,\frac{g}{mol}$) would be produced from 2.50 g of K and excess Cl_2?

How many *grams* of KCl would be produced?

2. In the chemical reaction:

$$Na_2O + H_2O \longrightarrow 2\,NaOH$$

If 124 g of Na_2O (F.W. $61.98\,\frac{g}{mol}$) is reacted with excess H_2O, how many *grams* of NaOH (F.W. $40.00\,\frac{g}{mol}$) will be made?

If, instead, you wanted to make 100. g of NaOH, how many grams of Na_2O would you need?

3. In the decomposition reaction:

$$2\,\mathrm{NaClO_3} \longrightarrow 2\,\mathrm{NaCl} + 3\,\mathrm{O_2}$$

If you reacted 26.6 g of $\mathrm{NaClO_3}$ (F.W. 106.44 $\frac{\mathrm{g}}{\mathrm{mol}}$), what volume of $\mathrm{O_2}$ would you make at a pressure of 1.03 atm and a temperature of 30°C? (*Hint: Use* $PV = nRT$.)

4. In the precipitation reaction:

$$3\,\mathrm{CaCl_2\,(aq)} + 2\,\mathrm{Na_3PO_4\,(s)} \longrightarrow \mathrm{Ca_3(PO_4)_2\,(ppt)} + 6\,\mathrm{NaCl\,(aq)}$$

If you added an excess of powdered $\mathrm{Na_3PO_4}$ to 100. mℓ of an 0.200 $\frac{\mathrm{mol}}{\ell}$ solution of $\mathrm{CaCl_2}$, how many grams of precipitate would form? (*Assume any excess* $\mathrm{Na_3PO_4}$ *dissolves.*)

5. How many grams of precipitate would form if 94.6 g of $\mathrm{FeCl_3 \cdot 6\,H_2O}$ crystals were added to an aqueous solution containing an excess of $\mathrm{Na_2SiO_3}$? (*Hint: you will need to predict the products and balance the equation in order to do the stoichiometry.*)