PRE-LABORATORY ASSIGNMENT
SYNTHESIS OF POTASSIUM ALUMINUM SULFATE (ALUM)

Name ____________________________________________  Section___________

Chemical reactions are rarely as efficient as chemists would like. The amount of pure, isolated product is usually less than the theoretically possible yield. Reactions differ in their efficiency, so it is customary to record the yield actually obtained from a reaction sequence and compare it with the theoretical yield, reporting the comparison as the percentage yield for the sequence.

\[
\text{Percent yield} = \frac{\text{actual yield (g)}}{\text{theoretical yield (g)}} \times 100\%
\]

The actual yield is obtained by weighing the final product. The theoretical yield can be calculated from the balanced equation for the overall process and the amounts of starting materials used. The calculation is often complicated slightly by the fact that some of the reactants are in excess, so the starting material which limits the amount of product obtainable (the limiting reagent) must be determined first.

Pre-Laboratory Exercise

If you heat magnesium in air, it reacts with oxygen to give magnesium oxide according to the following unbalanced equation

\[
\text{_____ Mg(s) + _____ O}_2\text{(g) } \rightarrow \text{_____ MgO(s)}
\]

(a) Balance the equation
(b) If you begin with 10.0 g of Mg, what mass of MgO can be theoretically obtained?

(c) If you actually obtain 14.5 g of MgO, what is the percentage yield of this metal oxide?