PERCENT YIELD NOTES

Theoretical Yield: the amount of product predicted to form on the basis of the balanced chemical equation.
- the amount that can be produced IF 100% of all reactants react

Actual Yield: the amount of the product actually obtained in the reaction

Percent Yield: describes the efficiency of the reaction

\[
\text{Percent Yield} = \frac{\text{actual yield}}{\text{theoretical yield}} \times 100
\]

Practice:

Potassium chloride, can be prepared from potassium carbonate, by treating the carbonate with hydrochloric acid. When 45.8 g of potassium carbonate are added to an excess of HCl, 46.3 g of KCl are recovered from the reaction. (Water and carbon dioxide are also formed.) Calculate the theoretical yield and percent yield of potassium chloride.

\[
\text{K}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{KCl} + \text{H}_2\text{O} + \text{CO}_2
\]

\[
\frac{46.3\text{g KCl}}{45.8\text{g K}_2\text{CO}_3 \times \frac{39.1\text{g KCl}}{138.21\text{g K}_2\text{CO}_3}} = 49.41\text{g KCl theoretical yield}
\]

\[
\frac{46.3\text{g KCl x 100}}{49.41\text{g KCl}} = 93.72\%
\]

If 31.6 g of magnesium hydroxide is combined with 68.0 mL of 0.725 M hydrobromic acid, which is the limiting reactant? How many grams of magnesium bromide would be formed? If 2.76 g of magnesium bromide is actually produced calculate the percent yield.

\[
\text{Mg(OH)}_2 + 2\text{HBr} \rightarrow \text{MgBr}_2 + 2\text{H}_2\text{O}
\]

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