

Stoichiometry

CHMG145 Section 10

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Table 1:

Mass of CaCl_2	0.498 g
Mass of Na_2CO_3	0.502 g
Mass of filter paper + precipitate	0.476 g
Mass of filter paper	0.175 g

Shows the masses of our reactants (Row 1 - 2) and our products (Row 3 - 4). Row 3 shows our main product with the mass of the filter paper. The precipitate on the paper is what we are looking for.

Table 2:

Theoretical Yield of CaCO_3	0.449 g
Experimental Yield of CaCO_3	0.301g
Percent Yield of CaCO_3	67.04%

Shows the yields of the theoretical and experimental yield for the experiment. The theoretical yield is what we calculate via formula, and the experimental yield is what the experiment has determined. These values are then used to determine the percent yield as shown below

Theoretical Yield: *Determine the limiting reagent to find exactly how much product we will get*

$$\frac{(0.502\text{g Na}_2\text{CO}_3)}{(1)} * \frac{(1\text{ mol of Na}_2\text{CO}_3)}{(105.9888\text{ g Na}_2\text{CO}_3)} * \frac{(1\text{ mol of CaCO}_3)}{(1\text{ mol of Na}_2\text{CO}_3)} * \frac{(100.0869\text{ g CaCO}_3)}{(1\text{ mol of CaCO}_3)} = (0.474\text{ g CaCO}_3)$$

$$\frac{(0.498\text{g CaCl}_2)}{(1)} * \frac{(1\text{ mol of CaCl}_2)}{(110.98\text{ g CaCl}_2)} * \frac{(1\text{ mol of CaCO}_3)}{(1\text{ mol of CaCl}_2)} * \frac{(100.0869\text{ g CaCO}_3)}{(1\text{ mol of CaCO}_3)} = (0.449\text{ g CaCO}_3)$$

Percent Yield: *The ratio of the actual yield to the theoretical yield*

$$\% \text{ Yield} = (0.301\text{g} / 0.449\text{g}) * 100 = 67.04\%$$