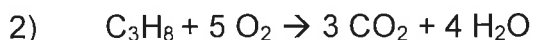


Percent, Actual, and Theoretical Yield



a) I began this reaction with 20 grams of lithium hydroxide. What is my theoretical yield of lithium chloride?

b) I actually produced 6 grams of lithium chloride. What is my percent yield?



a) If I start with 5 grams of C_3H_8 , what is my theoretical yield of water?

b) I got a percent yield of 75%. How many grams of water did I make?



My theoretical yield of beryllium chloride was 10.7 grams. If my actual yield was 4.5 grams, what was my percent yield?

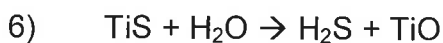


What is my theoretical yield of sodium oxide if I start with 20 grams of calcium oxide?



a) What is my theoretical yield of iron (II) chloride if I start with 34 grams of iron (II) bromide?

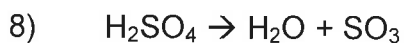
b) What is my percent yield of iron (II) chloride if my actual yield is 4 grams?



What is my percent yield of titanium (II) oxide if I start with 20 grams of titanium (II) sulfide and my actual yield of titanium (II) oxide is 22 grams?



What is my actual yield of uranium hexabromide if I start with 100 grams of uranium and get a percent yield of 83% ?



If I start with 89 grams of sulfuric acid and produce 7.1 grams of water, what is my percent yield?

Key

Percent, Actual, and Theoretical Yield

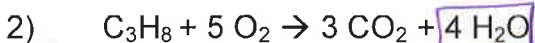


a) I began this reaction with 20 grams of lithium hydroxide. What is my theoretical yield of lithium chloride?

$$\frac{20 \text{ g LiOH}}{24 \text{ g}} \times \frac{\text{mol LiOH}}{1 \text{ LiOH}} = 0.83 \text{ mol LiOH} \times \frac{1 \text{ LiCl}}{1 \text{ LiOH}} = 0.83 \text{ mol LiCl} \times \frac{42 \text{ g LiCl}}{\text{mol}} = \boxed{34.86 \text{ g LiCl}}$$

b) I actually produced 6 grams of lithium chloride. What is my percent yield?

$$\frac{6 \text{ g}}{34.86} = \boxed{17\%}$$



a) If I start with 5 grams of C_3H_8 , what is my theoretical yield of water?

$$\frac{5 \text{ g C}_3\text{H}_8}{44 \text{ g}} \times \frac{\text{mol C}_3\text{H}_8}{1 \text{ C}_3\text{H}_8} = 0.11 \text{ mol C}_3\text{H}_8 \times \frac{4 \text{ H}_2\text{O}}{1 \text{ C}_3\text{H}_8} = 0.44 \text{ mol H}_2\text{O} \times \frac{18 \text{ g H}_2\text{O}}{1 \text{ mol}} = \boxed{7.92 \text{ g H}_2\text{O}}$$

Theoretical

b) I got a percent yield of 75%. How many grams of water did I make?

$$7.92 \times 0.75 = \boxed{5.94 \text{ g H}_2\text{O}}$$

Actual



My theoretical yield of beryllium chloride was 10.7 grams. If my actual yield was 4.5 grams, what was my percent yield?

$$\frac{4.5}{10.7} \times 100 = \boxed{42\%}$$



What is my theoretical yield of sodium oxide if I start with 20 grams of calcium oxide?

$$\frac{20 \text{ g CaO}}{56 \text{ g}} \times \frac{\text{mol CaO}}{1 \text{ CaO}} = 0.36 \text{ mol CaO} \times \frac{1 \text{ Na}_2\text{O}}{1 \text{ CaO}} = 0.36 \text{ mol Na}_2\text{O} \times \frac{62 \text{ g Na}_2\text{O}}{\text{mol}} = \boxed{22.32 \text{ g Na}_2\text{O}}$$

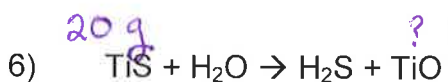


a) What is my theoretical yield of iron (II) chloride if I start with 34 grams of iron (II) bromide?

$$\frac{34 \text{ g FeBr}_2}{216 \text{ g}} \times \frac{\text{mol}}{\text{mol}} = 0.16 \text{ mol FeBr}_2 \left| \frac{1 \text{ FeCl}_2}{1 \text{ FeBr}_2} \right. = \frac{0.16 \text{ mol FeCl}_2}{\text{mol}} \left| \frac{126 \text{ g FeCl}_2}{\text{mol}} \right. = \boxed{20.16 \text{ g FeCl}_2}$$

b) What is my percent yield of iron (II) chloride if my actual yield is 4 grams?

$$\frac{4 \text{ g}}{20.16} = \boxed{19.8\%}$$



What is my percent yield of titanium (II) oxide if I start with 20 grams of titanium (II) sulfide and my actual yield of titanium (II) oxide is 22 grams?

Calculate theoretical first

$$\frac{20 \text{ g TiS}}{180 \text{ g}} \times \frac{\text{mol}}{\text{mol}} = 0.25 \text{ mol TiS} \left| \frac{1 \text{ TiO}}{1 \text{ TiS}} \right. = \frac{0.25 \text{ mol TiO}}{\text{mol}} \left| \frac{64 \text{ g TiO}}{\text{mol}} \right. = \boxed{16 \text{ g TiO}}$$

Use theoretical to find % yield

$$\frac{\text{Actual} \rightarrow 22 \text{ g}}{\text{Theoretical} \rightarrow 16 \text{ g}} \times 100 = 137.5\%$$



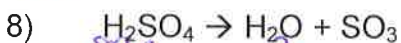
What is my actual yield of uranium hexabromide if I start with 100 grams of uranium and get a percent yield of 83%?

Find theoretical

$$\frac{100 \text{ g U}}{238 \text{ g}} \times \frac{\text{mol}}{\text{mol}} = 0.42 \text{ mol U} \left| \frac{1 \text{ UBr}_6}{1 \text{ U}} \right. = \frac{0.42 \text{ mol UBr}_6}{\text{mol}} \left| \frac{718 \text{ g UBr}_6}{\text{mol}} \right. = \boxed{301.56 \text{ g UBr}_6} \text{ Theoretical}$$

Theoretical * % = Actual

$$301.56 \times 0.83 = \boxed{250.3 \text{ g}} \text{ Actual}$$



If I start with 89 grams of sulfuric acid and produce 7.1 grams of water, what is my percent yield?

Find theoretical

$$\frac{89 \text{ g H}_2\text{SO}_4}{98 \text{ g}} \times \frac{\text{mol}}{\text{mol}} = 0.91 \text{ mol H}_2\text{SO}_4 \left| \frac{1 \text{ H}_2\text{O}}{1 \text{ H}_2\text{SO}_4} \right. = \frac{0.91 \text{ mol H}_2\text{O}}{\text{mol}} \left| \frac{18 \text{ g}}{\text{mol}} \right. = \boxed{16.38 \text{ g H}_2\text{O}} \text{ Theoretical}$$

Calculate % yield

$$\frac{\text{Actual} \rightarrow 7.1 \text{ g}}{\text{Theoretical} \rightarrow 16.38 \text{ g}} \times 100 = \boxed{43.3\%}$$