

Name : _____ Date : _____

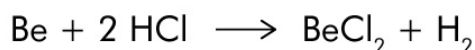
Limiting Reagent and Percentage Yield

- 1 Dichlorine monoxide is produced by passing chlorine gas over heated mercury (II) oxide according to the following unbalanced reaction:



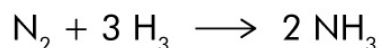
Balance the reaction. Suppose the quantity of the reactants is sufficient to produce 0.86 g of Cl_2O , but only 0.71 g is obtained. What is the percentage yield?

- 2 Consider the following reaction:



The theoretical yield of beryllium chloride was 10.7 g. Suppose the reaction actually yields 4.5 g. What is the percentage yield?

- 3 Nitrogen and hydrogen at high temperatures are converted to ammonia using the following reaction:



When 400 g of H_2 are added to an excess amount of N_2 , 104 g of NH_3 are formed. Calculate the percentage yield.

Limiting Reagent and Percentage Yield

Answers

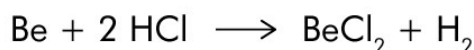
- 1 Dichlorine monoxide is produced by passing chlorine gas over heated mercury (II) oxide according to the following unbalanced reaction:



Balance the reaction. Suppose the quantity of the reactants is sufficient to produce 0.86 g of Cl_2O , but only 0.71 g is obtained. What is the percentage yield?

$$\text{Percentage yield} = \frac{\text{actual yield}}{\text{theoretical yield}} \times 100 = \frac{0.71 \text{ g}}{0.86 \text{ g}} \times 100 = 83\%$$

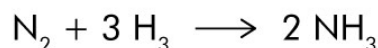
- 2 Consider the following reaction:



The theoretical yield of beryllium chloride was 10.7 g. Suppose the reaction actually yields 4.5 g. What is the percentage yield?

$$\text{Percentage yield} = \frac{\text{actual yield}}{\text{theoretical yield}} \times 100 = \frac{4.5 \text{ g}}{10.7 \text{ g}} \times 100 = 42\%$$

- 3 Nitrogen and hydrogen at high temperatures are converted to ammonia using the following reaction:



When 400 g of H_2 are added to an excess amount of N_2 , 104 g of NH_3 are formed. Calculate the percentage yield.

$$400 \text{ g H}_2 \times \frac{1 \text{ mol H}_2}{2 \text{ g H}_2} \times \frac{2 \text{ mol NH}_3}{3 \text{ mol H}_2} \times \frac{17 \text{ g NH}_3}{1 \text{ mol NH}_3} = 2267 \text{ g H}_2 \text{ (theoretical)}$$

$$\text{Percentage yield} = \frac{\text{actual yield}}{\text{theoretical yield}} \times 100 = \frac{104 \text{ g}}{2267 \text{ g}} \times 100 = 4.5\%$$