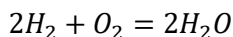


C11 - 4.2 - Percent Yield/Percent Purity p.136

$$\text{Percent Yield} = \frac{\text{mass of product obtained}}{\text{mass of product expected}} \times 100\%$$

If 20 g of O_2 is reacted with an excess of H_2 , 7.4 g of H_2O is formed. What is the percentage yield?

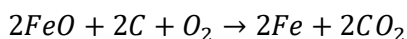


$$\text{mass } H_2O = 20 \text{ g } O_2 \times \frac{1 \text{ mol } O_2}{32 \text{ g } O_2} \times \frac{1 \text{ mol } H_2O}{1 \text{ mol } O_2} \times \frac{18 \text{ g } H_2O}{1 \text{ mol } H_2O} = 11.25 \text{ g } H_2O$$

$$\text{Percent Yield} = \frac{7.4 \text{ g } H_2O}{11.25 \text{ g } H_2O} \times 100\% = 65.8\%$$

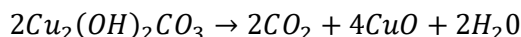
$$\text{Percent Purity} = \frac{\text{mass of pure reactant}}{\text{mass of impure reactant}} \times 100\%$$

If 100.0g of FeO produces 12.9 g of pure Fe , what is the % purity of the FeO used?



$$12.9 \text{ g } Fe \times \frac{1 \text{ mol } Fe}{55.8 \text{ g } Fe} \times \frac{2 \text{ mol } FeO}{2 \text{ mol } Fe} \times \frac{71.8 \text{ g } FeO}{1 \text{ mol } FeO} = 16.6 \text{ g } FeO$$

$$\% \text{ Purity} = \frac{16.6}{100} \times 100\% = 16.6\%$$



If 87% Yield, find mass of 3.7% pure $Cu_2(OH)_2CO_3$ to produce 100g CuO .

$$100 \text{ g } CuO \times \frac{1 \text{ mol}}{79.5 \text{ g}} \times \frac{2 \text{ mol } Cu_2(OH)_2CO_3}{4 \text{ mol } CuO} \times \frac{221 \text{ g}}{\text{mol}} = 138.9937 \text{ g } Cu_2(OH)_2CO_3$$

$$\frac{138.99}{x} = 0.037 \quad \frac{3756.5867}{x} = 0.87$$

$$x = 3756.5867 \quad x = 4317.91 \text{ g}$$

OR

$$\frac{100}{x} = 0.87$$

$$x = 114.9426$$

$$114.9426 \text{ g } CuO \times \frac{1 \text{ mol}}{79.5 \text{ g}} \times \frac{2 \text{ mol } Cu_2(OH)_2CO_3}{4 \text{ mol } CuO} \times \frac{221 \text{ g}}{\text{mol}} = 159.7629 \text{ g } Cu_2(OH)_2CO_3$$

$$\frac{159.7629}{x} = 0.037$$

$$x = 4317.91$$