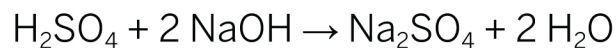
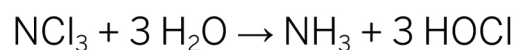


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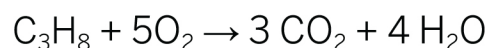
1. Calculate the number of moles of NaOH that are needed to react with 500 g of H₂SO₄ according to the following equation:



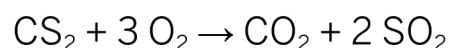
2. Calculate the mass of NH₃ that can be produced from the reaction of 125 g of NCl₃ according to the following equation:



3. Identify the limiting reactant and determine the mass of CO₂ that can be produced from the reaction of 25 g of C₃H₈ with 75 g of O₂ according to the following equation:



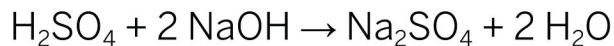
4. How many grams of SO₂ are produced when 152 g of CS₂ reacts with 48.0 g of O₂ according to the following equation:



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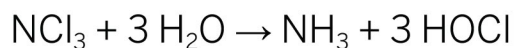
Answers

1. Calculate the number of moles of NaOH that are needed to react with 500 g of H₂SO₄ according to the following equation:



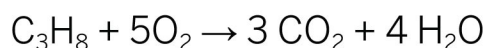
$$500 \text{ g H}_2\text{SO}_4 \times (1 \text{ mol H}_2\text{SO}_4 / 98.079 \text{ g H}_2\text{SO}_4) \times (2 \text{ mol NaOH} / 1 \text{ mol H}_2\text{SO}_4) = 10.19 \text{ mol H}_2\text{SO}_4$$

2. Calculate the mass of NH₃ that can be produced from the reaction of 125 g of NCl₃ according to the following equation:



$$125 \text{ g NCl}_3 \times (1 \text{ mol NCl}_3 / 120.365 \text{ g NCl}_3) \times (1 \text{ mol NH}_3 / 1 \text{ mol NCl}_3) \times (17.031 \text{ g NH}_3 / 1 \text{ mol NH}_3) = 17.69 \text{ g NH}_3$$

3. Identify the limiting reactant and determine the mass of CO₂ that can be produced from the reaction of 25 g of C₃H₈ with 75 g of O₂ according to the following equation:



$$25 \text{ g C}_3\text{H}_8 \times (1 \text{ mol C}_3\text{H}_8 / 44.1 \text{ g C}_3\text{H}_8) = 0.567 \text{ mol C}_3\text{H}_8$$

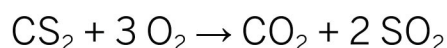
$$75 \text{ g O}_2 \times (1 \text{ mol O}_2 / 32 \text{ g O}_2) = 2.34 \text{ mol O}_2$$

$$0.567 \text{ mol C}_3\text{H}_8 \times (5 \text{ mol O}_2 / 1 \text{ mol C}_3\text{H}_8) = 2.835 \text{ mol O}_2$$

O₂ is the limiting reagent.

$$2.34 \text{ mol O}_2 \times (3 \text{ mol CO}_2 / 5 \text{ mol O}_2) \times (44 \text{ g CO}_2 / 1 \text{ mol CO}_2) = 61.8 \text{ g CO}_2$$

4. How many grams of SO₂ are produced when 152 g of CS₂ reacts with 48.0 g of O₂ according to the following equation:



$$152 \text{ g CS}_2 \times (1 \text{ mol CS}_2 / 76.139 \text{ g CS}_2) = 2 \text{ mol CS}_2$$

$$48 \text{ g O}_2 \times (1 \text{ mol O}_2 / 32 \text{ g O}_2) = 1.5 \text{ mol O}_2$$

$$1.5 \text{ mol O}_2 \times (2 \text{ mol SO}_2 / 3 \text{ mol O}_2) \times (64.066 \text{ g SO}_2 / 1 \text{ mol SO}_2) = 64.1 \text{ g SO}_2$$