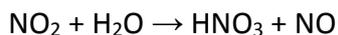


Answer on Question #45019 – Chemistry – Other

Question



How many grams of nitrogen dioxide are required in this reaction to produce 5.00 g HNO₃?

Solution

Molar mass of NO₂: $M(\text{NO}_2) = 46.01 \text{ g/mol}$

Molar mass of HNO₃: $M(\text{HNO}_3) = 63.01 \text{ g/mol}$

Balanced chemical equation is



As is clear from the balanced chemical equation, 3 mol of NO₂ are required to produce 2 mol of HNO₃. Thus, we can write the proportion

$$2 \cdot M(\text{HNO}_3) - 3 \cdot M(\text{NO}_2)$$

$$m(\text{HNO}_3) - m(\text{NO}_2)$$

$$m(\text{NO}_2) = 3 \cdot M(\text{NO}_2) \cdot m(\text{HNO}_3) / 2 \cdot M(\text{HNO}_3) = 3 \cdot 46.01 \cdot 5.00 / 2 \cdot 63.0 = 5.48 \text{ g}$$

Answer: 5.48 g of nitrogen dioxide are required to produce 5.00 g HNO₃