

Stoichiometry

Step 1

Write a balanced chemical equation

Step 2

Calculate moles of your known substance

$$\left(\frac{\text{mass}}{\text{molar mass}} \right)$$

$$\left(\frac{\text{volume of gas}}{\text{molar volume}} \right)$$

(moles)

$$\left(\frac{\text{representative particles}}{\text{Avogadro's number}} \right)$$

Step 3

Use the mole ratio to calculate moles of your unknown substance

$$\left(\frac{\text{coefficient of unknown}}{\text{coefficient of known}} \right)$$

Step 4

Convert from moles to the specified quantity

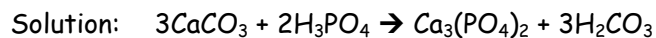
$$\left(\text{molar mass} \right) \rightarrow = \text{ ______ } g$$

$$\left(\text{molar volume} \right) \rightarrow = \text{ ______ } L$$

$$= \text{ ______ } \text{ mol}$$

$$\left(\text{Avogadro's number} \right) \rightarrow = \text{ ______ } \text{ representative particles}$$

Example: 50.0 g of calcium carbonate was added to excess phosphoric acid. What mass of calcium phosphate was formed?



$$\left(\frac{50.0 \text{ g CaCO}_3}{100.0872 \text{ g/mol}} \right) \left(\frac{1 \text{ mol Ca}_3(\text{PO}_4)_2}{3 \text{ mol CaCO}_3} \right) (310.17672 \text{ g/mol}) = 51.7 \text{ g Ca}_3(\text{PO}_4)_2$$