Stoichiometry

Stoichiometry is calculating amounts of products or reactants involved in chemical reactions.

These amounts may be mass, volume of gases, volume of solutions, numbers of particles or moles.

The key in solving these problems is the balanced chemical equation.

The coefficients of a balanced equation are the mole ratios of the substances in the reaction.

Example Problem

What mass of potassium chlorate is needed to produce 35.62 grams of oxygen?

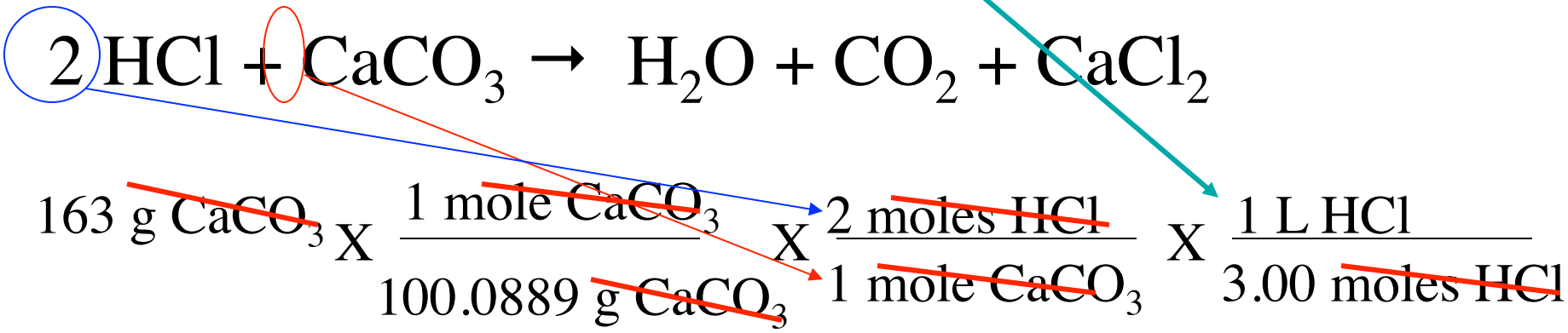
$$2\,KClO_3 \rightarrow 2\,KCl + 3\,O_2$$

$$35.62\ g\ O_2 \times \frac{1\ mole\ O_2}{31.9988\ g\ O_2} \times \frac{2\ mole\ KClO_3}{3\ mole\ O_2} \times \frac{122.5492\ g\ KClO_3}{1\ mole\ KClO_3}$$

$$90.95\ g\ KClO_3$$

Example Problem

What volume of 3.00 M hydrochloric acid (hydrogen chloride) is required to react with 163 grams of marble (calcium carbonate)? Products are water, carbon dioxide and calcium chloride.



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