

Calculate the mass of calcium oxide residue gotten when 82g of calcium carbonate is heated to a steady mass.

Calcium carbonate can be decomposed in a next way:



As can you see, the mole ratio between calcium carbonate and calcium oxide is 1: 1, it means that one mole of calcium carbonate can produce one mole of calcium oxide.

$n = m/M_w$ , where n is amount, m is mass and  $M_w$  is molecular weight

$$n_1 = n_2$$

$$m_1/M_{w1} = m_2/M_{w2}$$

$$m_1 = 82 \text{ g}$$

$$M_{w1} = 100 \text{ g/mol}$$

$$m_2 = X$$

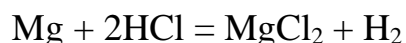
$$M_{w2} = 56$$

$$X = (82/100) * 56 = \mathbf{45,92 \text{ g}}$$

Calculate the volume hydrogen produced when 6g of magnesium reacts with excess dilute hydrochloric acid at s.t.p

One mole of any gas at stp contains volume of 22.4 L

Let's find volume of hydrogen that produced when 6g of magnesium reacts with excess dilute hydrochloric acid at s.t.p



As can you see, the mole ratio between magnesium and hydrogen is 1: 1, it means that one mole of magnesium can produce one mole of hydrogen.

$$n_1 = n_2$$

$$m_1/Mw_1 = n_2$$

$$6/24 = 0.25 \text{ mol}$$

$$V = 22.4 * 0.25 = \mathbf{5.6 \text{ L}}$$