

Answer on Question #45402 – Chemistry – Other

Question

How many moles of potassium chlorate to be heated to produce 11.2 litre oxygen?

Solution

Number of moles in 11.2 litres of oxygen:

$$n_{O_2} = \frac{V_{O_2}}{V_m} = \frac{11.2 L}{22.4 \frac{L}{mol}} = 0.5 mol,$$

where V_m – molar volume.

The balanced chemical equation of potassium chlorate thermal decomposition is as follows



As is clear from the chemical equation, 2 moles of $KClO_3$ are to be heated to produce 3 moles of O_2 , i.e molar ratio $n_{KClO_3}/n_{O_2} = 2/3$. Hence

$$n_{KClO_3} = \frac{2}{3} \cdot n_{O_2} = \frac{2 \cdot 0.5}{3} = 0.33 mol$$

Answer: about **0.33 mole** of potassium chlorate is to be heated to produce 11.2 litres of oxygen.