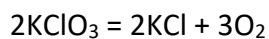


Question #72126, Chemistry / Inorganic Chemistry

If 183.7g of KClO_3 is completely burned catalytically. What volume of the oxygen gas will be obtain at 39c at 1200 torr pressure.

Answer:



Moles of KClO_3 :

$$n(\text{KClO}_3) = \frac{m(\text{KClO}_3)}{M(\text{KClO}_3)} = \frac{183.7 \text{ g}}{122.55 \frac{\text{g}}{\text{mol}}} = 1.499 \text{ mol}$$

According to chemical equation:

$$n(\text{O}_2) = \frac{3}{2} \times n(\text{KClO}_3) = \frac{3}{2} \times 1.499 \text{ mol} = 2.2485 \text{ mol}$$

Gas law:

$$\begin{aligned} pV &= nRT \\ p &= 1200 \text{ torr} = 159986.8 \text{ Pa} \\ T &= 39 \text{ }^\circ\text{C} = 312.15 \text{ K} \\ V &= \frac{nRT}{p} = \frac{2.2485 \text{ mol} \times 8.31 \frac{\text{J}}{\text{K} \times \text{mol}} \times 312.15 \text{ K}}{159986.8 \text{ Pa}} = 0.0365 \text{ m}^3 = \mathbf{36.5 \text{ L}} \end{aligned}$$

Answer provided by AssignmentExpert.com