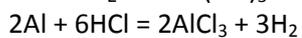
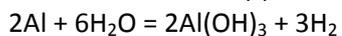


Question

What volume of H₂(g) is produced when 8.80 g of Al(s) reacts at STP?

Solution

In all reactions of Al(s) resulting in H₂ formation the molar ratio Al/H₂ is always 2/3, e.g.



Number of moles of Al:

$$n(\text{Al}) = m(\text{Al})/M(\text{Al}) = 8.80 / 26.98 = 0.33 \text{ mol}$$

$$n(\text{H}_2) = n(\text{Al}) \cdot 2/3 = 0.33 \cdot 3/2 = 0.49 \text{ mol}$$

At STP 1 mol of a gas occupies 22.4 L.

So, the volume of hydrogen produced is

$$V(\text{H}_2) = n(\text{H}_2) \cdot 22.4 = 0.49 \cdot 22.4 = 11.0 \text{ L}$$

Answer: 11.0 L