

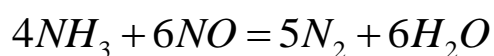
Answer on Question #84287 – Chemistry – General Chemistry

Task:

How many liters of NH_3 are needed to react completely with 16.0 L of NO (at STP)?

Solution:

The balance chemical equation is as follow,



One mole of an **ideal gas at STP** occupies 22.4 liters. ($V_m = 22.4 \text{ L/mol}$).

According to equation,

$$\frac{n(\text{NH}_3)}{4} = \frac{n(\text{NO})}{6};$$

$$n = \frac{V}{V_m};$$

$$\frac{V(\text{NH}_3)}{4 * V_m} = \frac{V(\text{NO})}{6 * V_m};$$

$$\frac{V(\text{NH}_3)}{2} = \frac{V(\text{NO})}{3};$$

$$V(\text{NH}_3) = \frac{2 * V(\text{NO})}{3} = \frac{2 * 16.0\text{L}}{3} = 10.67\text{L}$$

$$V(\text{NH}_3) = 10.67\text{L}$$

Answer: 10.67 liters of NH_3 .