

### Question #72758, Chemistry / Other / Completed

Given the equation  $3\text{H}_2 + \text{N}_2 = 2\text{NH}_3$ . Find how much  $\text{H}_2$  should be used to produce 170 g of  $\text{NH}_3$

#### Solution

$v(\text{NH}_3) = m(\text{NH}_3) / M(\text{NH}_3)$ ,  $M(\text{NH}_3) = 17 \text{ g/mol}$ , the molar mass.

$v(\text{NH}_3) = 170 \text{ g} / 17 \text{ g} = 10 \text{ mol}$

Each 3 mol of  $\text{H}_2$  produce 2 mole of  $\text{NH}_3$ . So  $v(\text{H}_2) = 15 \text{ mol}$ .

$V(\text{H}_2) = v \cdot V_m = 15 \text{ mol} \cdot 22.4 \text{ L/mol} = 336 \text{ L}$ .

#### Answer

15 mol or 336 L of  $\text{H}_2$ .

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