

## Answer on Question #68506 - Chemistry - Other

### Task:

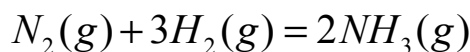
How many liters of  $\text{NH}_3$  gas could be prepared by reacting 750L of nitrogen gas with an excess of hydrogen gas in the following reaction?  $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$ .

### Solution:

Let us find the amount of nitrogen ( $\text{N}_2$ ):

$$n(\text{N}_2) = \frac{V(\text{N}_2)}{V_m} = \frac{750\text{L}}{22.4\text{L/mol}} = 33.482 \text{ moles of } \text{N}_2.$$

The reaction equation:



By the reaction equation:  $n(\text{N}_2) = \frac{n(\text{NH}_3)}{2}$

Then,

$$n(\text{NH}_3) = 2 * n(\text{N}_2) = 2 * 33.482 = 66.964 \text{ moles of } \text{NH}_3.$$

$$V(\text{NH}_3) = n(\text{NH}_3) * V_m = 66.964 \text{ mol} * 22.4\text{L/mol} = 1500 \text{ L}.$$

**Answer:** 1500 liters of  $\text{NH}_3$ .