

Answer on Question #71461 - Chemistry - General Chemistry

If 316 g of ammonia produces 1,225 g of ammonium bromide by reacting with excess hydrogen bromide, what is the percent yield of this reaction?

Solution.

$$NH_3 + HBr = NH_4Br$$
$$n(NH_3) = \frac{m(NH_3)}{M(NH_3)} = \frac{316 \text{ g}}{17.03 \text{ g/mol}} = 18.55 \text{ mol};$$

So, $n(NH_4Br) = 18.55 \text{ mol}$ – theoretical amount of substance.

$$n(NH_4) = \frac{m(NH_4Br)}{M(NH_4Br)} = \frac{1225 \text{ g}}{97.94 \text{ g/mol}} = 12.51 \text{ mol.} \text{ – actual amount of substance.}$$

$$\% \text{ yield} = \frac{\text{actual } n(NH_4Br)}{\text{theoretical } n(NH_4)} \times 100\% = \frac{12.51}{18.55} \times 100\% = 67.44\%$$

Answer: 67.44%.

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