Answer on Question #66061 - Chemistry -General Chemistry

How many molecules (not moles) of NH_3 are produced from 4.81×10^{-4} g of H_2?

Solution:

$$3H_2 + N_2 = 2NH_3$$

$$n(H_2) = \frac{m(H_2)}{M(H_2)} = \frac{4.81 \times 10^{-4}}{2} = 2.405 \times 10^{-4} \text{ moles}$$

$$n(H_2) : n(NH_3) = 3 : 2$$

$$n(NH_3) = \frac{2 \times n(H_2)}{3} = \frac{2 \times 2.405 \times 10^{-4}}{3} = 1.603 \times 10^{-4} \text{ moles}$$

$$N(NH_3) = n(NH_3) \times N_A = 1.603 \times 10^{-4} \times 6.02 \times 10^{23} = 9.65 \times 10^{19} \text{ molecules}$$

Answer:

9.65×10^{19} molecules.