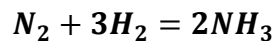*Answer on Question #63340 - Chemistry - General Chemistry*

How many moles of nitrogen gas is needed to react with 54.7 liters of hydrogen gas to produce ammonia gas?

Solution

The reaction is:

$$N_2 + 3H_2 = 2NH_3$$

The amount of N_2 can be estimated as:

$$\nu(N_2) = \frac{\nu(H_2)}{3} = \frac{V(H_2)}{3 \times V_M} = \frac{54.7\ L}{3 \times 22.4\frac{L}{mol}} = 0.814\ mol$$

Answer: $0.814\ mol$