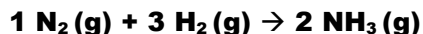


MUST SHOW WORK FOR CREDIT

- 1.) What volume of hydrogen gas at 580. mm Hg and 127°C is required to produce 0.895 g of NH₃?
(R = 0.0821 L atm/ mol K)



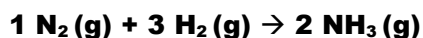
Step 1: Covert grams of NH₃ to Moles of H₂

Step 2: Look at the Gas Law constant to determine units.

Step 3: Convert Temperature and Pressure to match the units of the Gas Law constant.

Step 4: Now rearrange the Ideal Gas Law equation to solve for Volume and substitute in the values.

- 2.) What volume of N₂ would be required to produce the NH₃ under the same conditions of temperature and pressure? (R = 0.0821 L atm/ mol)



Step 1: Covert grams of NH₃ to Moles of N₂. (Note everything stays the same except for moles N₂.)

Step 2: Look at the Gas Law constant to determine units.

Step 3: Convert Temperature and Pressure to match the units of the Gas Law constant.

Step 4: Now rearrange the Ideal Gas Law equation to solve for Volume and substitute in the values.

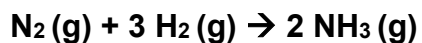
- 3.) What is the molar mass of a gas if 1.45 g occupies 830. mL at 735 mm Hg and 22.0 °C? ($R = 0.0821 \text{ L atm/ mol K}$)

Step 1: Since R has units of atm, L, and K. You must convert Pressure, Volume, and Temperature.

Step 2: Since molar mass = grams/ mole, rearrange the Ideal Gas Law to solve for moles.

Step 3: Now take the number of grams from the word problem and divide by the number of moles to calculate the grams/mole for Molar Mass.

- 4.) What volume of hydrogen gas at STP is required to produce 85.0 g of NH_3 ? ($R = 8.314 \text{ kPa L/ mol K}$)



Step 1: Covert grams of NH_3 to Moles of H_2 . (Note everything stays the same except for moles N_2 .)

Step 2: Look at the Gas Law constant to determine units.

Step 3: Convert Temperature and Pressure to match the units of the Gas Law constant.

Step 4: Now rearrange the Ideal Gas Law equation to solve for Volume and substitute in the values.

- 5.) A sample of nitrogen gas, N_2 , is collected in a 100 mL container at a pressure of 688 mm Hg and a temperature of 565°C . How many grams of nitrogen gas are present in this sample? ($R = 8.314 \text{ kPa L / mol K}$)

Step 1: Look at the Gas Law constant to determine units.

Step 2: Convert the Volume, Temperature, and Pressure to match the units of the Gas Law constant.

Step 3: Solve Ideal Gas Law for number of moles.

Step 3: Use the molar mass of nitrogen gas to convert to grams.

- 6.) Determine the molar mass of a gas that has a density of 2.18 g/L at 66°C and 720 mm Hg. ($R = 8.314 \text{ kPa L / mol K}$)

Step 1: Look at the Gas Law constant to determine units.

Step 2: Convert the Volume, Temperature, and Pressure to match the units of the Gas Law constant.

Step 3: Solve Ideal Gas Law for number of moles.

Step 3: Use the grams from the density and the moles from above to solve for molar mass.

Challenge: What is the density of chlorine gas at STP?