Answer on Question #67784 - Chemistry – General Chemistry

Question:

A sample of hydrogen exerts a pressure of 0.389 ATM and has a volume of 7.0L the pressure increases to 3.35 ATM at constant temperature what will its new volume be?

Solution:

The ideal gas is described by the law

$$PV = nRT,$$

where P is the pressure, V is the volume, n is the amount in moles, T is the temperature, and R is the ideal gas constant. From this law, the volume, V is

$$V = \frac{nRT}{P}.$$

With fixed values of n and T (R is fixed as it is a constant), the volume changes inversely to the pressure:

$$\frac{V_1}{V_2} = \frac{P_2}{P_1} \rightarrow V_2 = \frac{P_1}{P_2} V_1$$

Thus,

V_2=7x0.389/3.35=0.813 (L)

Answer:

The volume of the gas would be 0.813 L.