Answer on Question #53788 - Chemistry - General Chemistry

Question:

If you have a 2 liter balloon filled with helium at 14.7 psi and at a temperature of 300K, what is the volume of the balloon when the temperature increases to 320K?

Solution:

Volume of helium in the balloon after increasing of the temperature we found from the equation:

$$PV=nRT$$

Where P-pressure, V-volume of the gas, n- amount of mol of the gas, T – temperature,

R- universal gas constant. Amount of mol of the gas we found from the equation $n=V/V_{mol}$,

Where V-volume of the gas, V_{mol}- molar volume. n=2/22,4=0,09mol. 14,7psi= 101,3kPa

$$V=\frac{nRT}{P}= \frac{0,09mol\times8,31J/mol\times K\times320K}{101,3kPa}= 2,36l$$

Answer: 2,36l