

Answer on Question#59837 – Chemistry | General Chemistry

If we assume that the air - the ideal gas equation holds Mendeleev-Clapeyron:

$$p \cdot V = n \cdot R \cdot T$$

When (for current conditions):

$$V = [m^3] = 0,0012 \text{ m}^3$$

$$P = [\text{Pascal}] = 101325 \text{ Pa}$$

$$R = 8,314 \text{ [Joule/mole} \cdot \text{K]}$$

$$T = [^\circ\text{K}] = 651 \text{ K}$$

$$n = \frac{pV}{RT} = \frac{101325 \cdot 0,0012}{8,314 \cdot 651} = 0,0225 \text{ mol}$$

Quantity molecules of gas are present under these condition:

$$N = n \cdot N_a$$

$$N_a = 6,02 \cdot 10^{23} \text{ mol}^{-1} \text{ (Avogadro constant)}$$

$$N = 0,0225 \text{ mol} \cdot 6,02 \cdot 10^{23} = 1,35 \cdot 10^{22} \text{ molecules}$$