

**Volume of gas stp is  $1.12 \times 10^{-7}$  calculate no of molecules.**

It is known that 1 mol of any gas has the volume of 22,4 litres upon standard conditions. The number of molecules is calculated by the following equation:

$$N = v \times N_a,$$

where  $N_a$  – is an Avogadro constant and equals  $6,022 \times 10^{23} \text{ mol}^{-1}$ . So, it means that 1 mol of any substance contains such number of elementary particles (molecules in our task).

Firstly, let's calculate the number of moles of our gas by a simple proportion:

$$\begin{array}{l} 1 \text{ mol of gas} \text{ — } 22,4 \text{ litres} \\ X \text{ moles of gas} \text{ - } 1.12 \times 10^{-7} \end{array}$$

So,  $X = (1.12 \times 10^{-7} \times 1) / 22,4 = 5 \times 10^{-9}$  moles

Now we can calculate the number of molecules:

$$N = 5 \times 10^{-9} \times 6,022 \times 10^{23} = \mathbf{3,011 \times 10^{15}}$$

**Answer: total number of molecules in this gas upon stp is  $3,011 \times 10^{15}$ .**

Remark: we assumed that given volume of gas was indicated in litres.