

How many atoms are in a 5.00g sample of argon? 1 atom of argon weighs 40.0 amu.

**Solution:**

To solve this task we need to determine number of moles of given argon sample:

$$n(\text{Ar}) = \frac{m(\text{Ar})}{M(\text{Ar})} = \frac{5.00 \text{ g}}{40 \text{ g/mol}} = 0.125 \text{ mol}$$

(Where m – mass of argon in grams, M – molar mass of argon)

Also, number of moles could be determined using number of atoms:  $n(\text{Ar}) = \frac{N(\text{Ar})}{N_A(\text{Ar})}$  (where

n – number of moles of argon, N – number of atoms of argon,  $N_A$  – Avogadro constant).

Then:

$$N(\text{Ar}) = n(\text{Ar}) * N_A = 0.125 \text{ mol} * 6.022 * 10^{23} \text{ mol}^{-1} = 7.5275 * 10^{22}$$

**Answer:**

There are  $7.5275 * 10^{22}$  atoms in 5 grams of argon.

Answer provided by [www.AssignmentExpert.com](http://www.AssignmentExpert.com)