

Avogadro's Constant and the Mole

istry, we don't talk about a certain number of atoms because atoms are too small to count. We'd be talking in numbers if we were counting atoms. Instead, we use a called a mole.

1 mole = 6.022×10^{23} particles (atoms, ions, molecules or formula units)

= 602 200 000 000 000 000 000 000 particles!!!

$H_2O(m.c) - 6.022 \times 10^{23}$ molecules of water.

The number 6.022×10^{23} is called Avogadro's constant (N_A).

We realized that 6.022×10^{23} atoms of any element have a mass of 1 gram, that is equal to the numerical value of the element's atomic mass.

Example - one atom of carbon has a mass of 12.011 μ or amu,
one mole of carbon atoms has a mass of 12.011 g.
 The mass of iron has a mass of 55.845 μ , and one mole of iron has a mass of 55.845 g.

We use Avogadro's constant to calculate the number of moles of a substance, or the number of particles in a substance. We use the following symbols in our calculations:

$$n = \frac{N}{N_A}$$

Quantity	Unit
# of moles	mol
# of particles	atoms, ions, formula units or molecules
Avogadro's number (6.022×10^{23})	particles / mol

Now that 1 mole = 6.022×10^{23} particles. List the possible conversion factors from this equation:

1 mol (2) 6.022×10^{23}