

# THE MOLE

*(quantity not the mammal, spy or skin spot)*

- scales up the atomic world to our world
- it is the number of atoms, molecules or formula units large enough to be easily measured in the laboratory
- a number equal to the number of carbon atoms in 0.012 kg of  $^{12}\text{C}$
- the number, called Avogadro's number is  $6.02214 \times 10^{23}$
- the number has been calculated by two methods
  - 1) the kinetic theory of gases (using Avogadro's hypothesis of 1811)
  - 2) x-ray measurements of solid structures and solid density
- the important application of this for chemists is **molar mass**

**atomic molar mass** - the average mass of a mole of atoms based on the isotopic abundances

**formula molar mass** - sum of all the atomic molar masses in the chemical formula