

Unit of length is the Bohr radius:

$$a_0 = \frac{\hbar^2}{m_e e^2} \left(= 4\pi\epsilon_0 \frac{\hbar^2}{m_e e^2} \right)$$

The first is in atomic units, second in SI-units. This quantity can be remembered by recalling the virial theorem, i.e. that in absolute value, half of the potential energy is equal to the kinetic energy. This gives us

$$\frac{1}{2} \frac{e^2}{a_0} = \frac{\hbar^2}{2m_e a_0^2}$$

and if we accept this relation, we have the above value of a_0 .

The so called fine structure constant

$$\alpha = \frac{e^2}{\hbar c}$$

expresses in general the *weakness* of electromagnetic interaction.

Some Constants and Quantities

$v_0 = \alpha c = 2.18710^6 \text{ m s}^{-1}$	Bohr velocity
$a_0 = 0.529177 \cdot 10^{-10} \text{ m}$	Bohr radius
$\hbar = 0.6582 \cdot 10^{-15} \text{ eV s}$	Planck's constant
$k_B = 0.8625 \cdot 10^{-4} \text{ eV } ^\circ\text{K}^{-1}$	Boltzmann constant
$R = N_A k_B$	
$N_A = 6.0222 \cdot 10^{23}$	Avogadro's number
$\mu_B = 0.579 \cdot 10^{-4} \text{ eV (Tesla)}^{-1}$	Bohr magneton

Plank's formula

$$\rho(\omega_{ba}) = \frac{\hbar \omega_{ba}^3}{\pi^2 c^3} \frac{1}{e^{\hbar\omega/kT} - 1}$$