#

(1) Charge: fundamental property of matter

→ Excess of e^-s → negative charge

→ Deficiency of e^-s → +ve charge

6×10^{18} → 1 C charge

∴ charge of 1 electron → $\frac{1}{6 \times 10^{18}} = -1.6 \times 10^{-19}$ C

(2) Ions:

⊕ ⊖

(3) Conductors → Valence & Conduction bands OVERLAP

Insulators → $E_g \approx 5$ eV or higher

Semiconductor → $E_g \approx 0.6$ to 1.1 eV

(4) $eV = E$ $\quad V = \frac{E}{Q}$

$E = VQ$

$E = 1.6 \times 10^{-19}\ V$

Why eV

Because energy is very small

$$n_i = N_0 \, T^{3/2} \exp\left(\frac{-E_g}{2KT}\right)$$

electrons/cm^3

N_0: 5.2×10^{15} constant

k: Boltzman's Constant 1.38×10^{-23} J/k

$E_g \uparrow \quad n_i \downarrow$

$T \uparrow \quad n_i \uparrow$

Si: $E_g = 1.12eV$

T: 300°k