Experiment 1

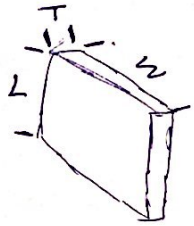
to identify the material

- Density & Distance between Atomes

Theory:

$$\text{Density} = \rho = \frac{M}{V} = L \times W \times T$$

(M: Mass, V: Volume)



- In Metal : atomes are spherical & identical
= (lattice structure) almost.

Total number of atomes:

$$N = (n) N_a = \frac{M}{A_w} N_A$$

(M: Mass; A_w: The atomic mass of The Material; N_A: Avogadro's n°)

or

$$N = \frac{M}{\rho a^3} \Rightarrow a = \sqrt[3]{\frac{A_w}{\rho N_a}}$$

now uncertainty in ρ:

$$\Delta\rho = \frac{\Delta M}{V} + \frac{M}{V^2}\Delta V$$

$$\frac{\Delta\rho}{\rho} = \frac{\Delta M}{M} + \frac{\Delta V}{V}$$

ΔM: estimated

$$\Delta V = WT\Delta L + \Delta WTL + W\Delta TL$$

$$\frac{\Delta V}{V} = \frac{\Delta L}{L} + \frac{\Delta W}{W} + \frac{\Delta T}{T}$$

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