

Chapter 4:-

Copper, steel FCC
Iron BCC

$$n_v = n e^{-Q/RT}$$

number of vacancies / cm³

n :- number of lattice points / atoms / cm³

Q: activation Energy

R: Gas Constant = 1.987 cal/mol.K = 8.314 J/mol.K

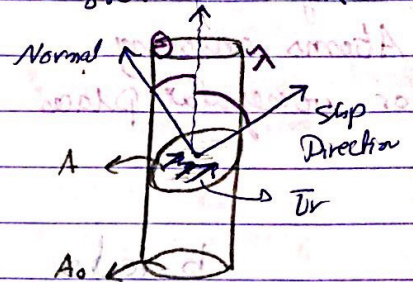
T: temperature

n v ↑ Temp ↑

Schmid's law:- $\tau = \sigma \cos \lambda \cos \phi$

$\tau_r = F_r / A$ Resolved shear stress

$\sigma = F / A_0$ Unidirectional stress applied on the cylinder



CRSS : to slip, CRSS = τ_r

if not make CRSS < τ_r

Hall-Petch equation:-

surface defects:-

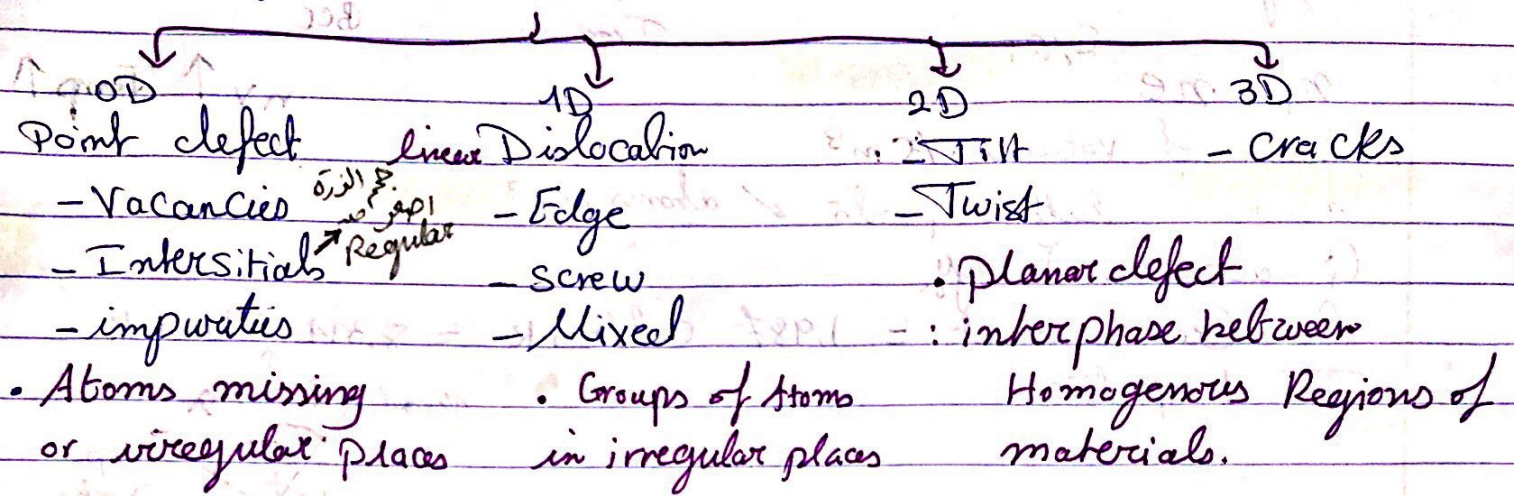
$$\sigma_y = \sigma_0 + K d^{-1/2}$$

yield strength σ_y is equal to σ_0 plus a constant K multiplied by the average diameter of grains d to the power of -1/2.

Importance of defects:-

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Defects in Solids



b-vector : represents the magnitude & direction of the lattice distortion resulting from a dislocation deformation