



SNS COLLEGE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION)

SNS Kalvi Nagar, Saravanampatti Post Coimbatore

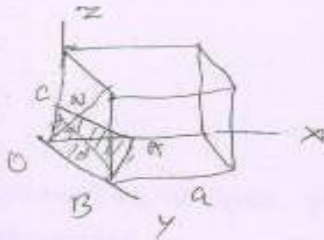
- 641 035

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Accredited by NBA & accredited by NAAC with 'A++' Grade, Recognized by UGC



a spacing in cubic lattice

d spacing is the distance b/w any two successive plane



Consider a cubic crystal with a as length of its cube edge & a plane ABC as shown in figure. This plane belong to a family of planes whose miller indices (hkl)

The \perp^{er} ON from the origin of the cube to the plane ABC represents interplanar spacing (d) of this family.

$$OA \text{ along } OX = a/h$$

$$OB \text{ along } OY = a/k$$

$$OC \text{ along } OZ = a/l$$

$$OA:OB:OC = \frac{1}{h} : \frac{1}{k} : \frac{1}{l} \\ = \frac{a}{h} : \frac{a}{k} : \frac{a}{l}$$

$$\cos \alpha' = \frac{ON}{OA} = \frac{d}{a/h} = \frac{dh}{a}$$

$$\cos \beta' = \frac{ON}{OB} = \frac{d}{a/k} = \frac{dk}{a}$$

$$\cos \gamma' = \frac{ON}{OC} = \frac{d}{a/l} = \frac{dl}{a}$$

$$\cos^2 \alpha' + \cos^2 \beta' + \cos^2 \gamma' = 1$$

$$\left(\frac{dh}{a}\right)^2 + \left(\frac{dk}{a}\right)^2 + \left(\frac{dl}{a}\right)^2 = 1$$

$$\frac{d^2}{a^2} (h^2 + k^2 + l^2) = 1$$

$$d^2 = \frac{a^2}{h^2 + k^2 + l^2}$$

$$d = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$



SNS COLLEGE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION)

SNS Kalvi Nagar, Saravanampatti Post Coimbatore

- 641 035

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Accredited by NBA & accredited by NAAC with 'A++' Grade, Recognized by UGC

