

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

closed packed Structure Hezagonal TOP Layer 2 middle layer battom Layer The unit Cell has one atom at each of the 12 corpors The unit cell has one atom at the center of the two faces The unit cell has 3 atoms arranged in body It consist of 3 layer At balton layer, the central atom has 6 nearest neighboring atoms in the plane. The middle layer has satoms and it is separted by the distance che from bottom layer. The stop layer is similar to the bottom layer and at a distance c from the bottom layer.

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

No of atoms per unit cell No. of atom in unit cell from the contribution 2 = 1 of corner atoms (TOP) = 1 -x6=1 NO. OF atom in Unit Cell from the Contribution of corner atoms (batton) No. of central atoms in both Upper subotton planes No. of middle layered atom = 3 1+1+1+3 =>b Co-ordination number bottom 1x1 is bonsist of The atom battom layeration = b above layer = 3 below layer = 3 6+3+3=12 atomic radius a=dr x= 9/2 Calculation of c/a ratio Page 2 of 4 19PYB103 & Physics for Engineers D.Sengottaiyan/AP/Physics

SNS COLLEGE OF TECHNOLOGY



SIS

(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

height of the chit all=c

$$A \rightarrow B_{2}$$

 $Cas so' = \frac{Ay}{AB}$
 $Ay = AB cas so'$
 $\overline{Ay = 4B}$
 $Ay = AB cas so'$
 $\overline{Ay = 4B}$
 x is order for $A \rightarrow Beo$,
 $Ax = \frac{2}{3}Ay$
 $A = \frac{2}{3}Ax^{2} + Cx^{2}$
We know $Ac = a$, $Ax = \frac{2}{3}A_{3}$, $Cx = C_{2}$
 $a^{2} = (\frac{a}{13})^{2} + (\frac{C}{13})^{2}$
 $a^{2} = \frac{a^{2}}{3} + \frac{c^{2}}{4}$
 $ae autory the above term$
 $a^{2} - \frac{a^{2}}{3} + \frac{c^{2}}{4}$
 $\frac{3a^{2} - a^{2}}{3} = \frac{c^{2}}{4}$
 $\frac{2a^{2}}{3} = \frac{c^{2}}{4}$
 $\frac{2a^{2}}{3} = \frac{c^{2}}{4}$
 $\frac{ax_{4}}{3} = \frac{c^{2}}{a^{2}} \Rightarrow \frac{B}{3} = \frac{c^{2}}{a^{2}} \Rightarrow \frac{C}{a} = \sqrt{\frac{B}{3}}$
 $= 1.633\mu$

19PYB103 & Physics for Engineers D.Sengottaiyan/AP/Physics







(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

Parting factor

$$P = \frac{1}{\sqrt{2}}$$

Volume of all the atoms per unit cell in $Hqp = b \times \frac{4}{3} \pi r^{3}$
 $= \frac{a_{13}}{3} \pi \left(\frac{a_{2}}{2}\right)^{3}$
 $= \frac{a_{13}}{3} \pi \left(\frac{a_{2}}{2}\right)^{3}$
 $= \frac{a_{13}}{3}$
Area of base = $b \times Area$ of triangle AOB
Area of triangle AOB = $\frac{1}{2}$ BO Ay
 $= \frac{1}{4} a \frac{a_{15}}{2} = \frac{a^{2}}{5} \frac{6}{4}$
Volume of the unit cell = Base Area? height².
 $V = \frac{a^{2}}{3} \frac{c_{13}}{2} \frac{c_{13}}{2}$
Parting faults = $\frac{1}{\sqrt{2}}$
 $= \frac{\pi a^{3}}{3} \frac{3}{3} \frac{c_{13}}{2} \frac{c_{23}}{2}$
 $= \frac{2\pi a^{3}}{3} \frac{1}{3} \frac{c_{13}}{2} \frac{c_{23}}{2} \frac{r_{13}}{8}$
 $= \frac{2\pi a^{3}}{3} \frac{x}{\sqrt{2}} \frac{z_{12}}{2} = \frac{7}{3} \frac{\pi}{3} \frac{a_{13}}{\sqrt{2}}$
 $= \frac{2\pi a^{3}}{3} \frac{x}{\sqrt{2}} \frac{x}{\sqrt{2}} \frac{z_{13}}{2} \frac{a_{13}}{\sqrt{2}} \frac{r_{13}}{\sqrt{2}}$
 $= \frac{2\pi a^{3}}{3} \frac{x}{\sqrt{2}} \frac{x}{\sqrt{2}} \frac{z_{13}}{2} \frac{a_{13}}{\sqrt{2}} \frac{r_{13}}{\sqrt{2}}$