
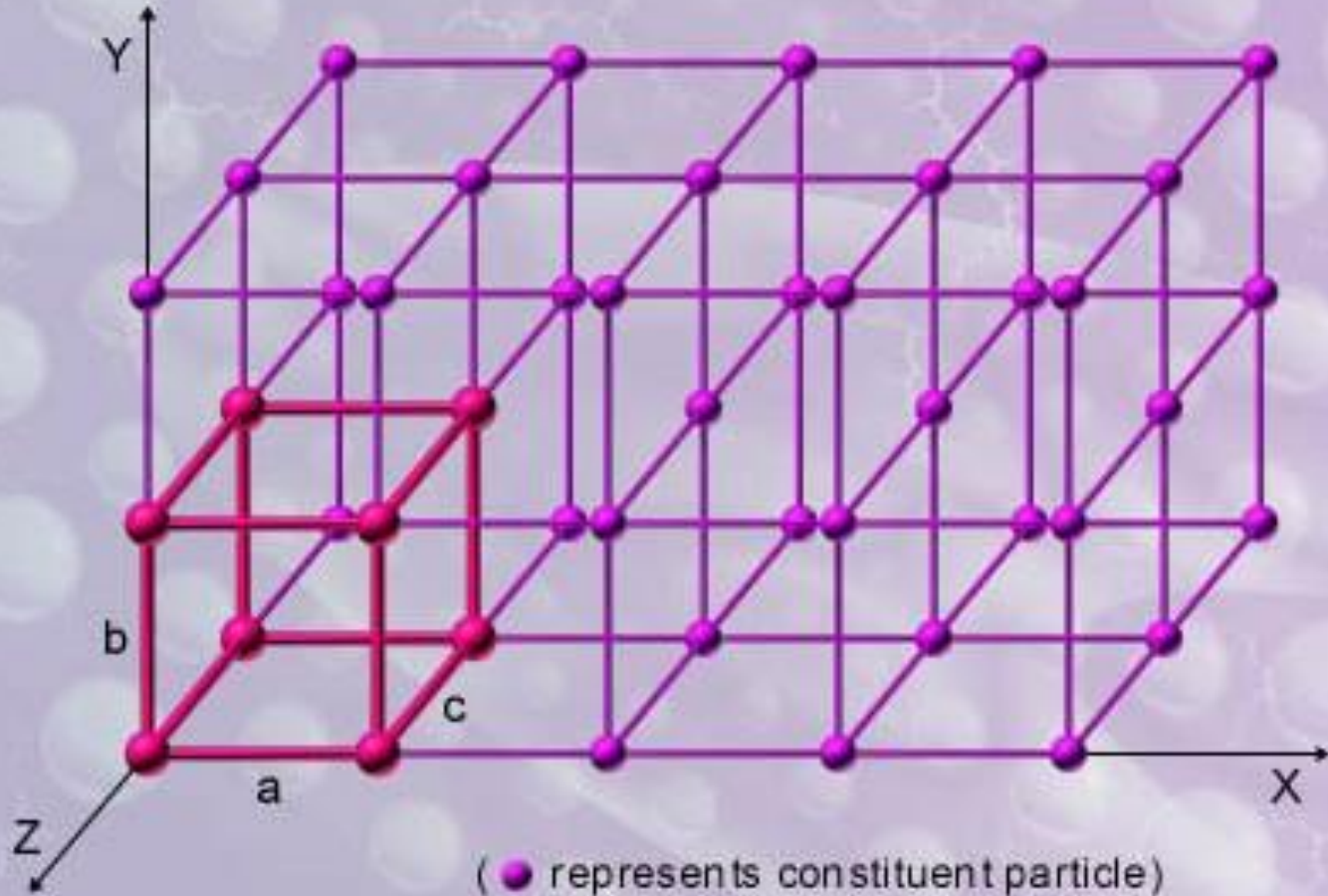


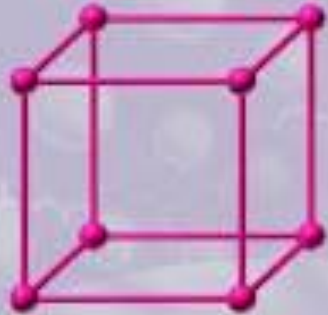
**THE SOLID
STATE
D.K.Das.
PGT CHEM.
KVK PATNA.**

A stylized silhouette of a mountain range in shades of teal, located at the bottom right of the slide.

Crystal lattice



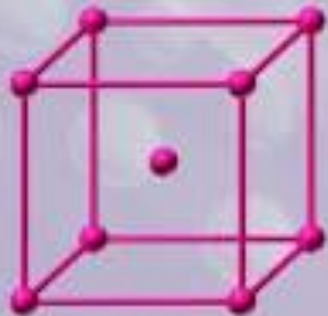
Crystal lattice



Simple cubic

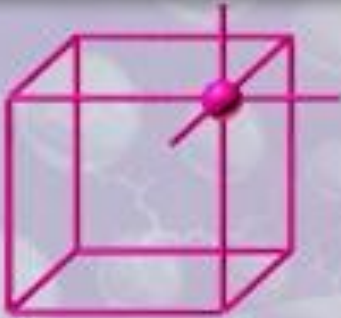


Face centred cubic

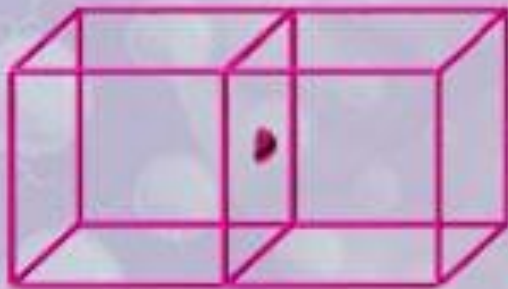


Body centred cubic

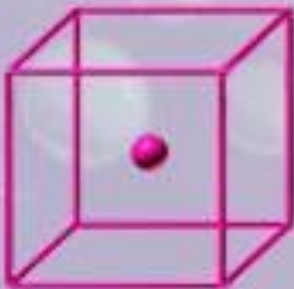
Number of particles in a unit cell



A corner atom shared by eight unit cells.

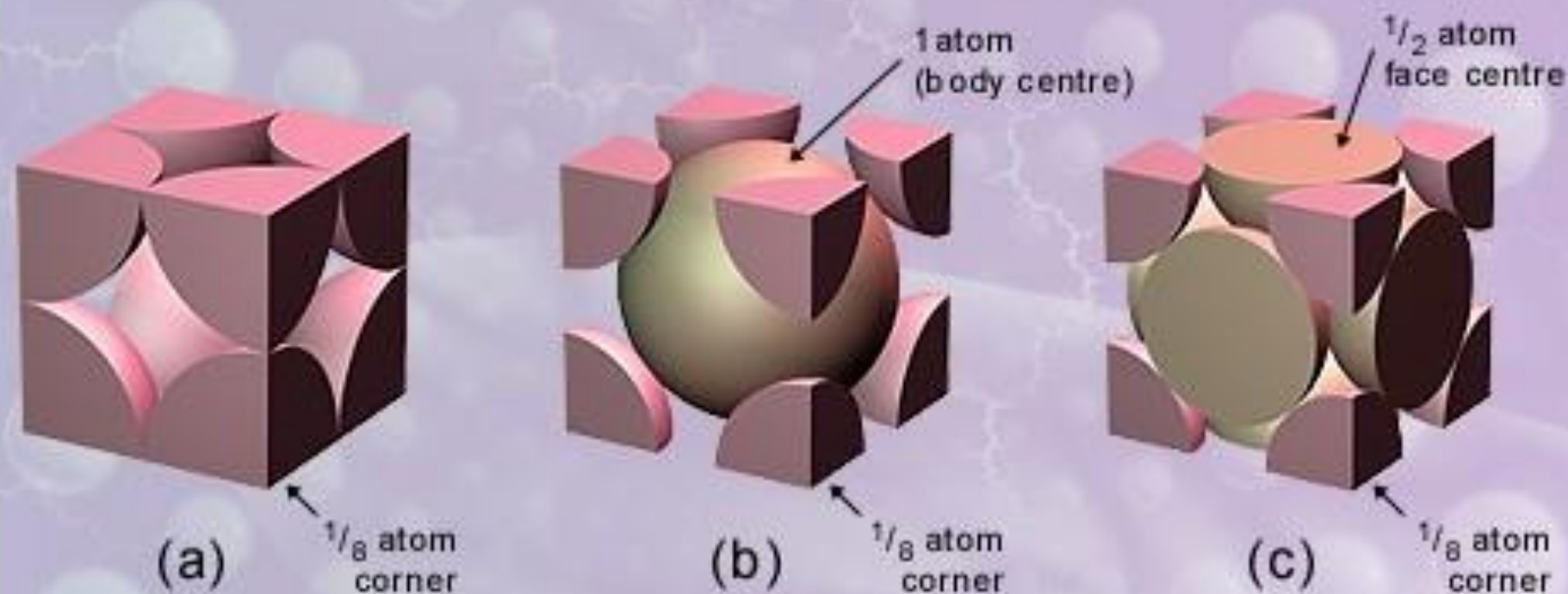


The face centered atom is equally shared by two unit cells.



The body centered atom is not shared by any other unit cell.

Simple Cubic



- One atom per unit cell of a simple cubic unit cell.
- Two atoms per unit cell of a bcc unit cell.
- 4 atoms per unit cell of a fcc unit cell.

One Dimensional Packing



Edge of crystal

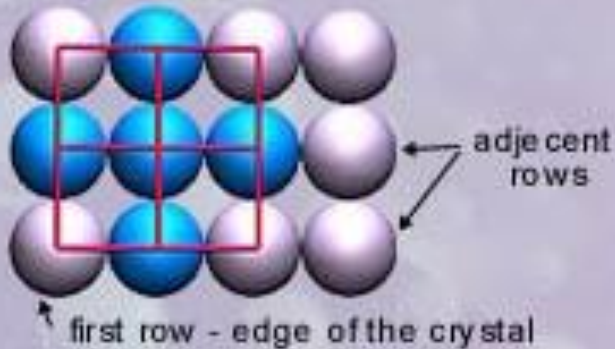
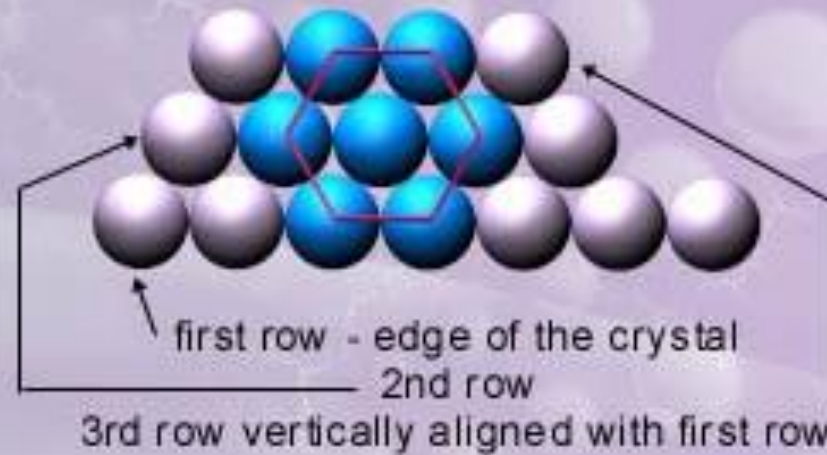


Close packing of spheres showing the edge formation in one dimension.

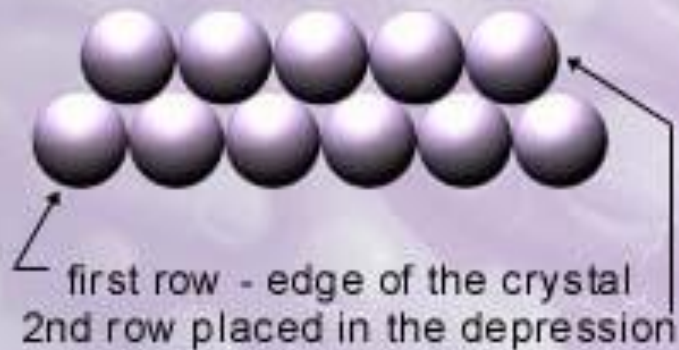
TWO DIMENSIONAL PACKING - PLANE FORMAT



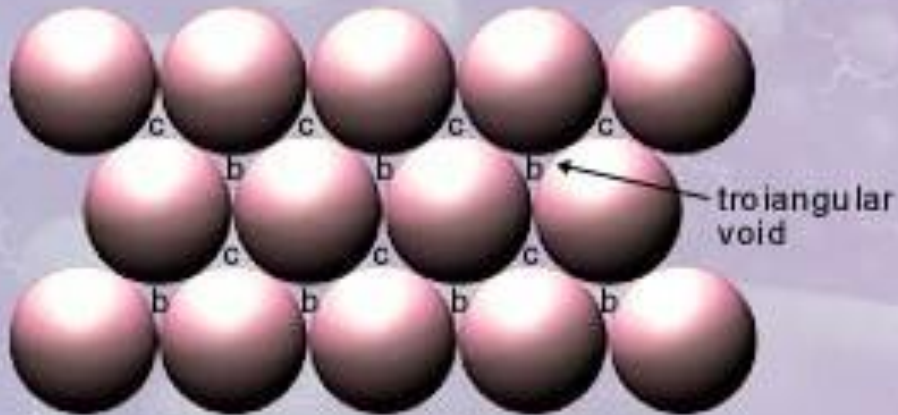
Plane of crystal



Plane formation in two dimension - square close packed layer

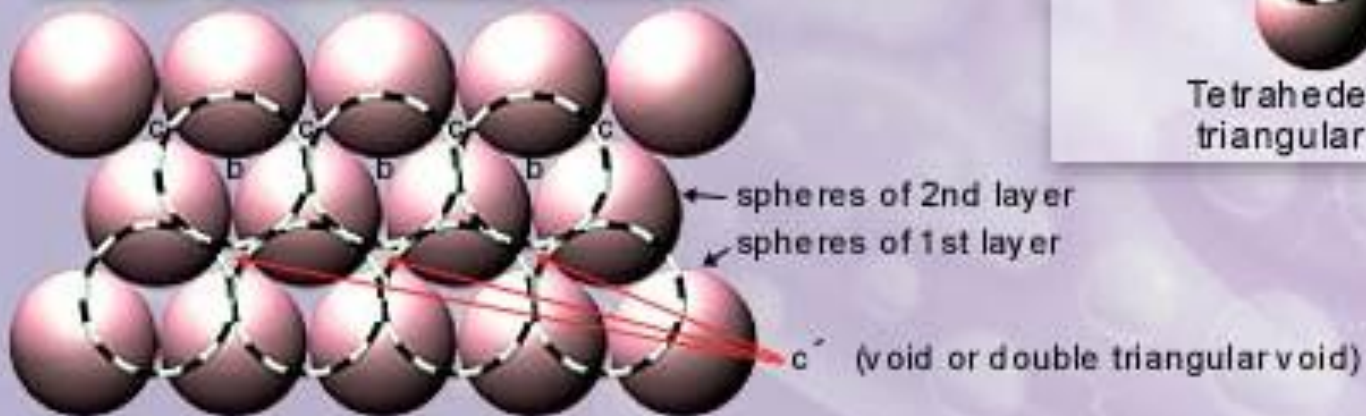


THREE DIMENSIONAL PACKING - PACKING OF LAYERS



Hexagonal close packed first layer

Packing of two layers together



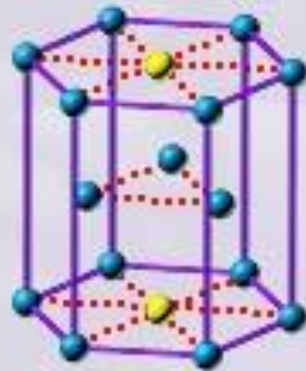
TYPES OF VOIDS



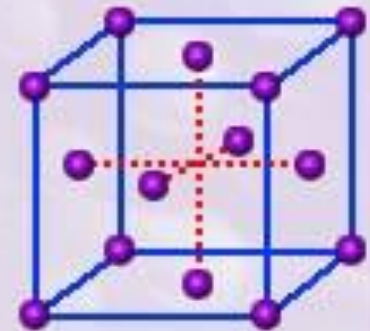
Double triangular void
or octahedral void



Tetrahedral or
triangular void

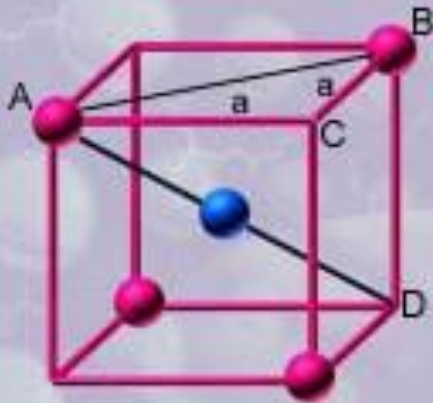


Hexagonal close
packing of spheres

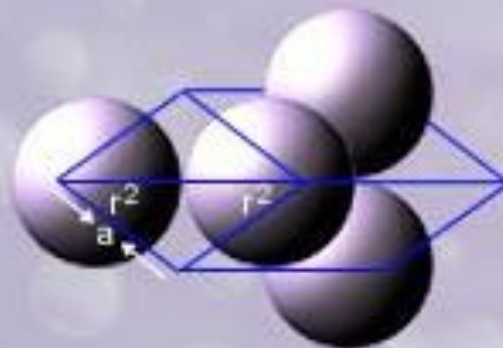


Cubic close
packing of spheres

RADIUS RATIO OF TETRAHEDRAL VOID

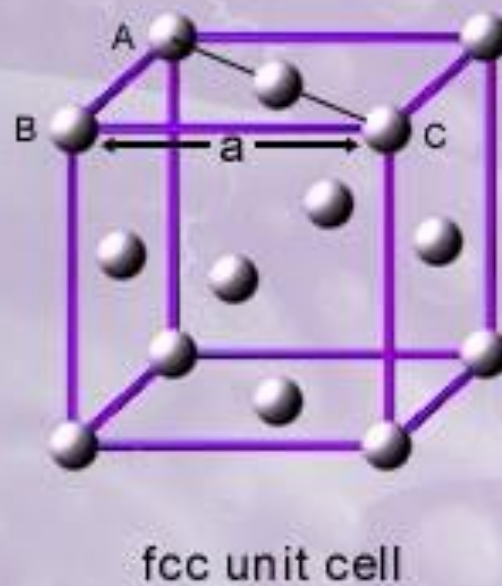
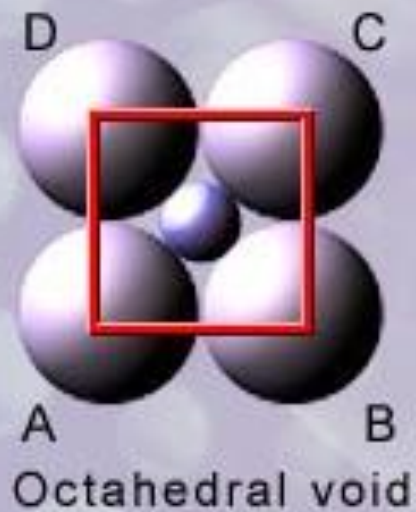


Tetrahedral void in a cubic



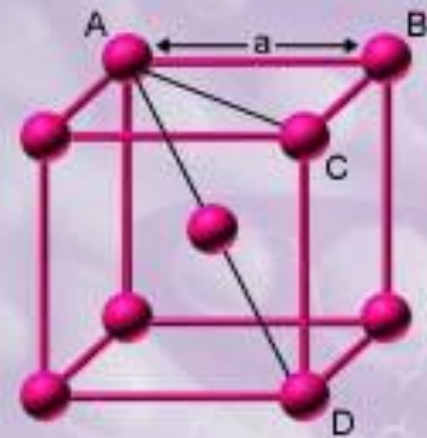
Geometry of a tetrahedral void

RADIUS RATIO OF OCTAHEDRAL VOID



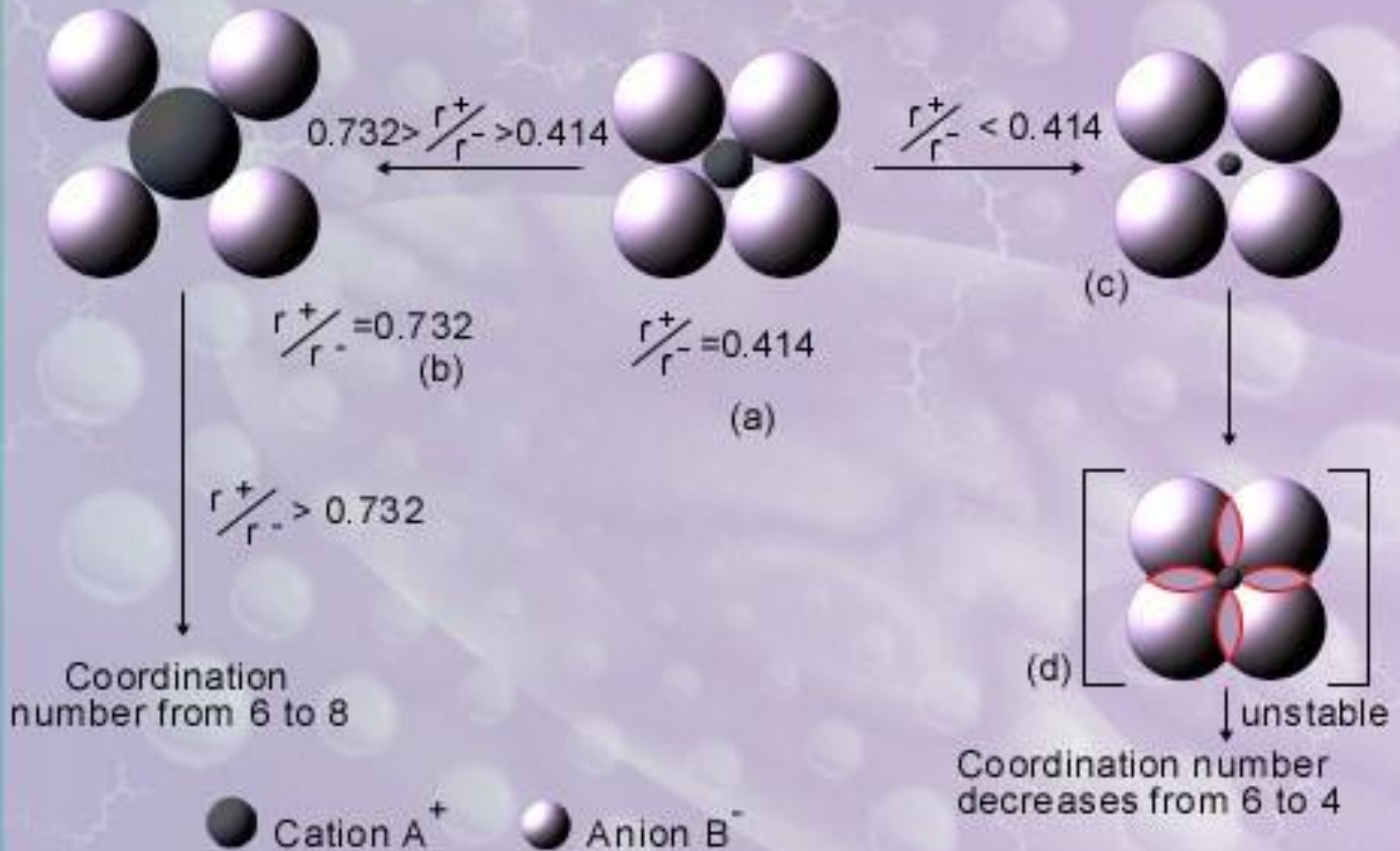


Dimensional view showing
4 atoms per unit cell

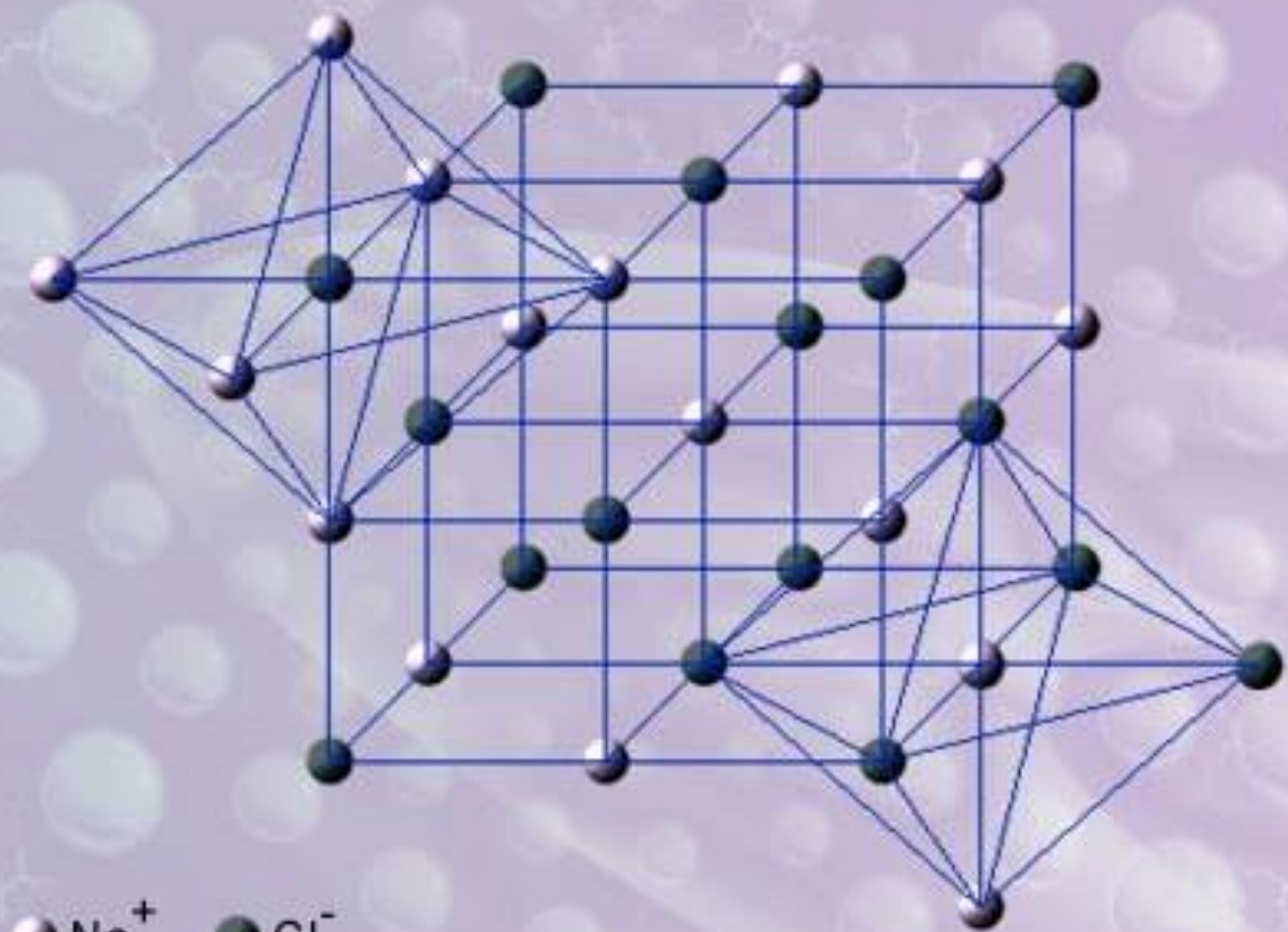


Body centred cubic unit cell

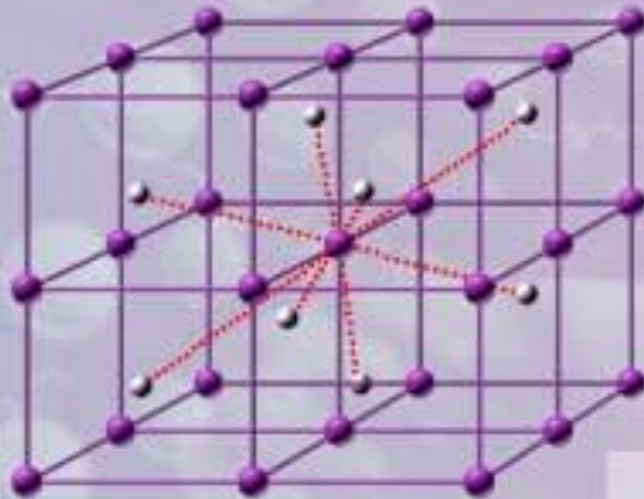
EFFECT OF RADIUS RATIO ON COORDINATION NUMBER



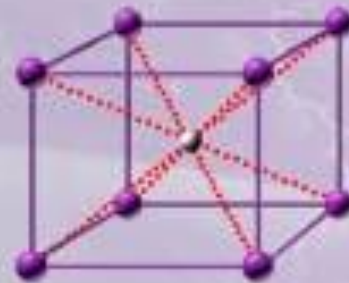
NaCl Structure



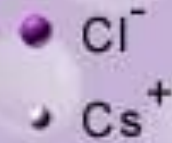
Caesium chloride CsCl type structure



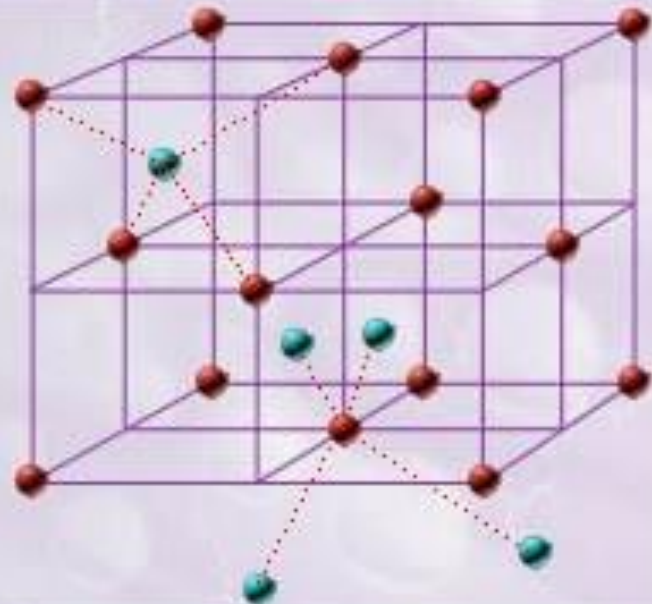
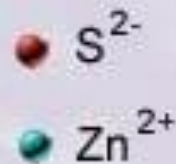
8 unit cell



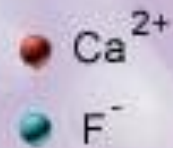
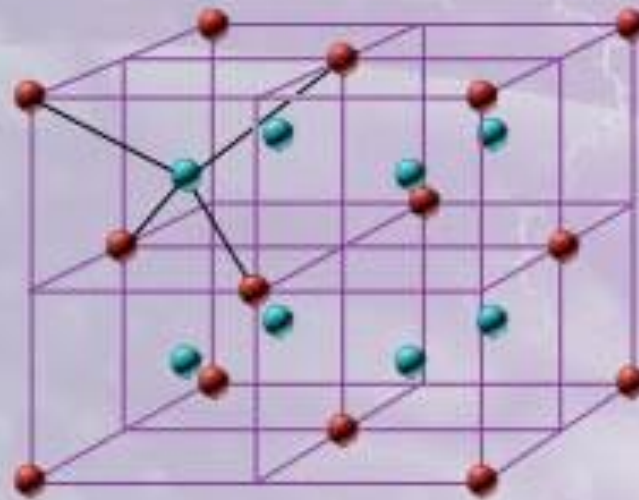
1 unit cell



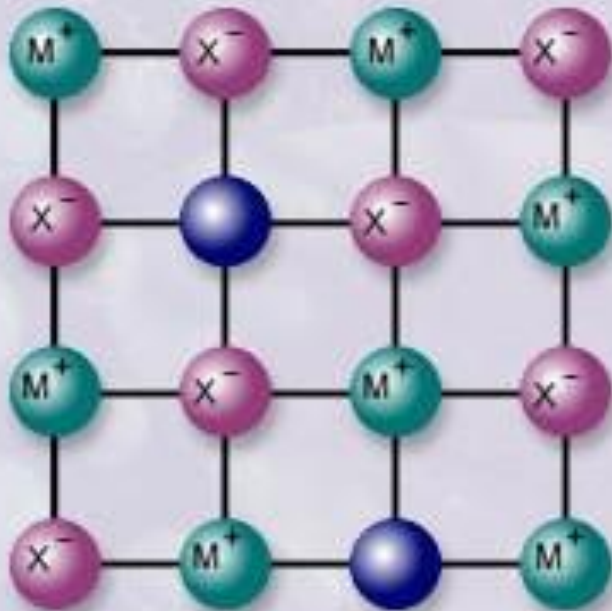
Structure of Zinc blende



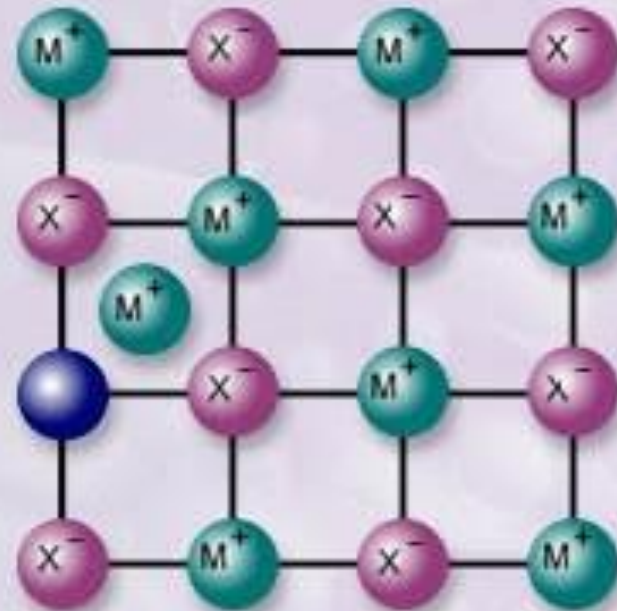
STRUCTURE OF FLUORITE (CaF_2)



SCHOTTKY DEFECT

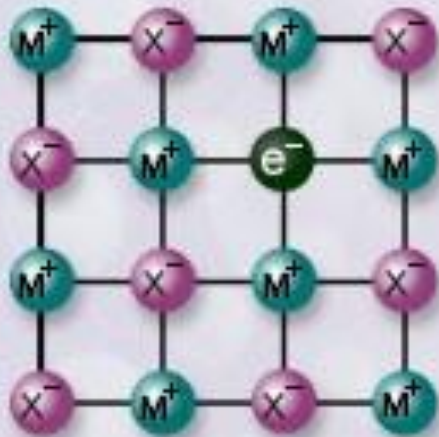


FRENKEL DEFECT



(● = ions are missing from their sites)

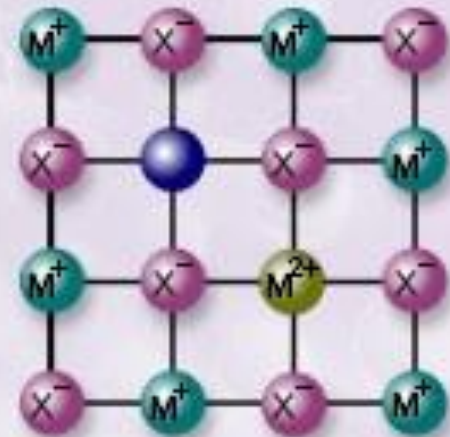
NON STOICHIOMETRIC DEFECTS



Metal excess defect
due to anion vacancies



Metal excess defect
due to interstitial cation



Metal deficiency
due to cation vacancy

◆ THANK YOU