• Empty or vacant space present between spheres of a unit cell, is called void or space or hole or interstitial void. When particles are closed packed resulting in either cpp or hcp structure, two types of voids are generated:
  
• **Tetrahedral voids** are holes or voids surrounded by four spheres present at the corner of a tetrahedron. Coordination number of a tetrahedral void is 4.

![Tetrahedral Void](image1)

\[ r_{\text{void}} = 0.225 \times r_{\text{sphere}} \]  
(for tetrahedral voids)

• **Octahedral voids** are holes surrounded by six spheres located on a regular tetrahedron. Coordination number of octahedral void is 6.

![Octahedral Void](image2)

\[ r_{\text{void}} = 0.414 \times r_{\text{sphere}} \]  
(for octahedral voids)

[The number of octahedral voids present in a lattice is equal to the number of close packed particles. The number of tetrahedral voids present in a lattice is twice to the number of close packed particles.]

**Density of Unit Cell** (d)

Density of unit cell = mass of unit cell / volume of unit cell

\[ d = Z \times \frac{M}{a^3} = \frac{ZM}{a^3} \times N_A \]

(The density of the unit cell is same as the density of the substance.)

where, \( d \) = density of unit cell
These substances have a net dipole moment due to unequal parallel and anti-parallel alignment of magnetic moments, e.g., Fe$_3$O$_4$, ferrites, etc.