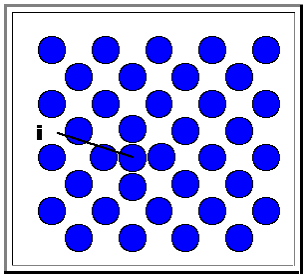
Interstitials

- Interstitials are all atoms sitting not on their regular place, but between other atoms. The picture shows the simple case of a self interstitial atom in an elemental **fcc** crystal.



  - If the crystal is viewed as periodic arrangement of hard spheres, interstitials sit in the interstices between the spheres. For the most prominent simple crystals there are two kinds of interstices: Octahedra- and Tetrahedra interstices or gaps.

- There are two basic kinds of interstitials: Intrinsic and extrinsic interstitials:

  - **Intrinsic interstitials** are interstitials atoms of the same kind as the atoms of the crystal "**self-interstitials**"). They are practically non existent in elemental crystals (i.e. in all metals) with the big exception of **Si**, where intrinsic interstitials play an important role in diffusion and microdefect formation.
  - **Extrinsic interstitials** are interstitial atoms of a foreign (extrinsic) type, e.g. **C** in **Fe** or **O** in **Si**. They may diffuse directly through the lattice (i.e. without the help of vacancies) and play an important role in many technically relevant materials.