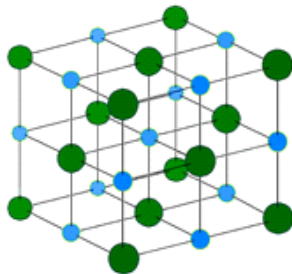


Notes 02/25

Monday, February 25, 2008
10:11 AM

- **Cubic packing**
 - 2 layers. 2nd layer fits on grooves of first layer
 - For each octahedral hole, there are 2 tetrahedral holes.
- 3rd layer can sit parallel to 1st layer or fit on grooves of 2nd layer.
 - Parallel to 1st layer is **hexagonal closest packing** (ABABAB)
 - Fits on grooves of 2nd layer is **cubic closest packing** (ABCABC)
- Types:
 - Cubic packing - 52% used space
 - Body centered cubic packing - 69%
 - Hexagonal closest packing 74% (ABABAB)
 - Cubic closest packing - 74%
- CCP vs. HCP
 - NaCl
 - CCP of all Cl
 - And all octahedral holes are filled with Na



The [sodium chloride](#) crystal structure is face-centered cubic (fcc). Each atom has six nearest neighbors, with octahedral geometry. The arrangement of the atoms of each type is known as *cubic close packed* (ccp).
Light blue = Na⁺ ([sodium](#) ion)
Dark green = Cl⁻ ([chloride](#) ion)

Pasted from <http://en.wikipedia.org/wiki/Face-centered_cubic>

- NiAs
 - HCP
- Zinc Sulfide
 - HCP, Zinc is in 1/2 of tetrahedral holes, octahedral holes would have nothing in them.
 - CCP, S & Zn in 1/2 of tetrahedral holes.
 - See voh slide
- CuCl, Cu₂O, diamond, cadmium chloride
 - CCP
- See chart in book and memorize.
- Responsible for: NaCl, NaAs, ZnSO₄ (2 types), Cadmium iodide, corundum, spinel (if time)... see voh for more