

6.1: Solid State Structures

Learning objectives for this unit are to:

- Describe and identify a unit cell within a 2D or 3D lattice
 - Identify, describe, and compare the common Bravais Lattices, including primitive cubic, body-centered cubic, face-centered cubic (or cubic closest packed), and hexagonal closest-packed
 - Identify the locations and comparative sizes of tetrahedral, octahedral, and cubic holes within a closest-packed lattice
 - Use the “radius ratio rule” to predict lattice types for ionic solids and explain why certain types of holes are filled or empty
 - Calculate edge length, density, and packing efficiency for a given lattice
 - Determine the metallic or ionic radius given the lattice type and density
 - Determine the number of atoms per unit cell, the coordination number per atom, and the atom stoichiometry given a picture or description of a lattice structure
 - Describe the following common ionic structural motifs: sodium chloride, sphalerite, wurtzite, fluorite, and anti-fluorite.
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