

Section 6-4 Metallic Bonding

Metallic Bonding

Chemical bonding that results from the attraction between metal atoms and the surrounding sea of electrons

Delocalized

Electrons do not belong to any one atom and move freely throughout the metal's network of empty orbitals.

Malleability

The ability of a substance to be hammered or beaten into thin sheets

Ductility

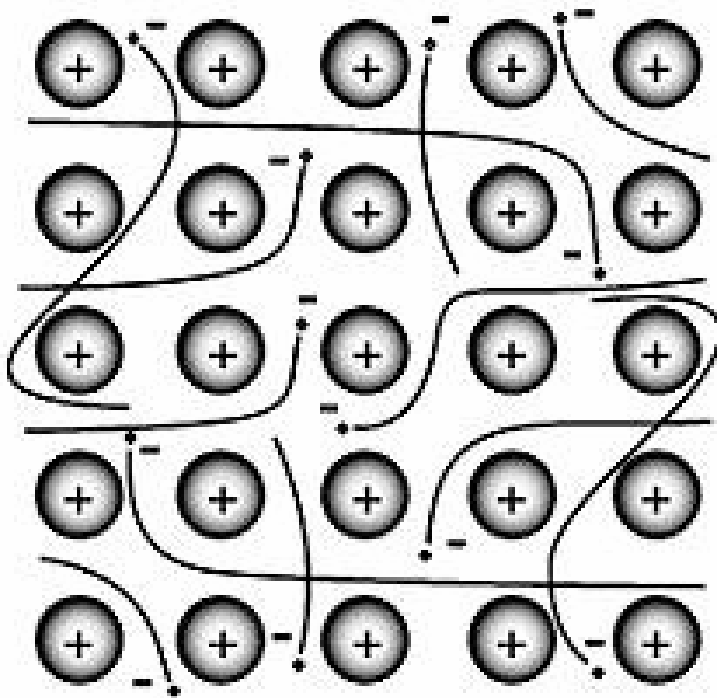
The ability of a substance to be drawn, pulled, or extruded through a small opening to produce a wire

Heat of Vaporization

The amount of heat required to vaporize a metal. This is dependent on the strength of bonds.

Structure of Metallic Bonding

Metals may have a crystal structure surrounded by a sea of electrons. The atoms are relatively fixed while the electrons are free to move around.



Section 6-4 Metallic Properties

- Metals have very few highest occupied energy level electrons and have many empty orbitals. This allows electrons to move freely through empty orbitals.
- Electrons in metals can become delocalized and move freely throughout the metal's network of empty orbitals.
- Metals can be deformed as seen in properties such as malleability and ductility.
- Thermal and electrical conductivity result from the free moving sea of electrons.
- Photon emission from excited electrons returning to ground state are the reason for the shiny appearance of metals

Deformation of Metal – Malleability and Ductility

Metallic bonds are the same in every direction throughout an entire solid. One plane of atoms in a metal can slide past another without breaking any bonds.

