

Chemistry 2.4

Structure, bonding and Thermodynamics

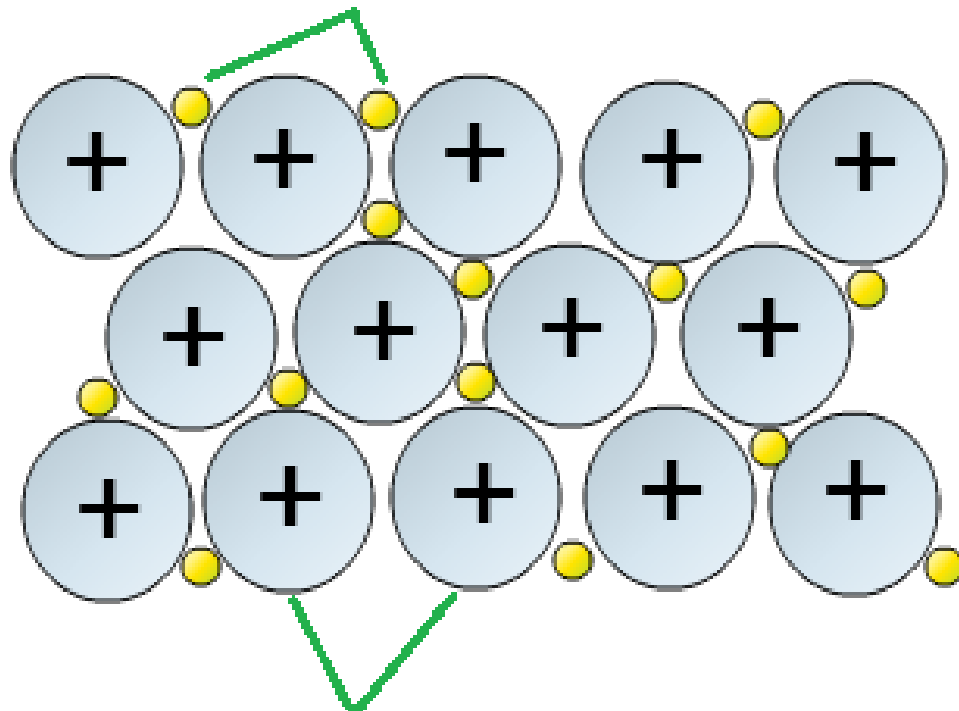
Metallic solids

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- Metallic solids are made up of metal atoms
- The best description of the structure is
“**positive ions** in a ‘sea’ of **mobile electrons**”

The idea is that although the **positive ion** repel each other, they are **held together** by the **MOBILE electrons**.

**Free Electrons from outer
shell of metal atoms**



Metal ions

mp and bp

- The attraction between the **cation** and **free electrons** is an **electrostatic attraction**.
- This electrostatic attraction is **strong** and require **lots of energy to overcome**
- Therefore metals usually has **high melting** and **boiling point**

Conductivity

- In order to conduct an electrical current, moveable charged particles are needed
- Because there are moveable charged particles (namely the electrons), metals are good electrical conductors.

Malleability and Ductility

- Malleable
 - The capability of being shaped
- Ductile
 - The capability of being stretched

Metals are both malleable and ductile.

This is because the sea of electrons allow the ions to slide past each other without being repelled

