

Chemistry 2.4

Structural, bonding and Thermodynamics

Discrete molecular substance
and its physical properties

Physical Properties

- Physical properties describe the behaviour of a substance when it is subjected to physical change.
- These are some examples of physical properties:
 - Melting point and boiling point
 - Malleability and Ductility
 - Electrical conductivity
 - Hardness

Molecular substances

- A discrete molecular solid is made out of molecules tightly packed together in a repeated array (lattice).
- Each molecule is a single particle and is held together by a weak intermolecular force.
- The term intermolecular force can only be used for discrete molecular substances.

Melting and boiling points

- The energy required to separate the particles increases as the attraction between the particles increases.
- Therefore higher melting and boiling points.
- Intermolecular force is weak, therefore discrete molecular substance has low melting point

Polarity

- Intermolecular forces increase with polarity
- Polar molecules have higher polarity than non-polar molecules
- This is because the polar molecules are attracted to each other by their slightly charged end
- Therefore polar molecules have a higher melting point than non-polar molecules

Hardness and electrical conductivity

- Molecular substances are soft because the attraction between the particles are weak.
- Molecular substances do not conduct electricity because there are no moveable charged particles.