

CHEMICAL BONDING

A T A G L A N C E

BONDING TYPES - Summary

CHEMICAL

strong bonds

- ionic (or electrovalent)
- covalent
- dative covalent (or co-ordinate)
- metallic

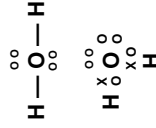
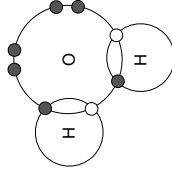
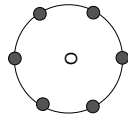
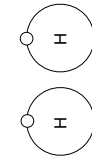
PHYSICAL

weak bonds

- van der Waals' forces - *weakest*
- dipole-dipole interaction
- hydrogen bonds - *strongest*

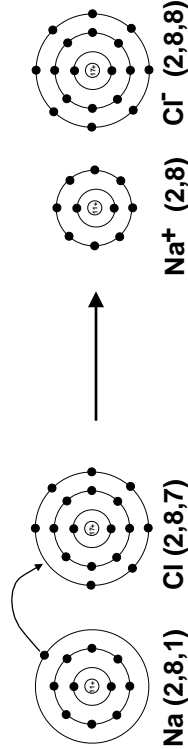
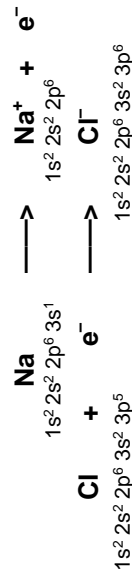
COVALENT

- between atoms of the same element; (e.g. in N₂, O₂, diamond, graphite)
- between atoms of different elements on the RHS of table; (e.g. CO₂, SO₂)
- when one of the elements is in the middle of the table; (e.g. C, Si)
- head-of-the-group elements with high I.E.'s, (e.g. Be in BeCl₂)
- consists of a **shared pair of electrons**, one electron coming from each atom
- atoms share to try and get an 'octet' of electrons
- leads to the formation of simple molecules and giant molecules (e.g. silica)



IONIC

- between atoms on LHS and atoms on RHS of Periodic Table
- electrons are **TRANSFERRED** between atoms
- atoms end up as ions
- strong electrostatic attraction between ions of opposite charge
- giant ionic crystal lattice structure
- compounds ... high melting points, brittle, water soluble
conduct when molten or in aqueous solution

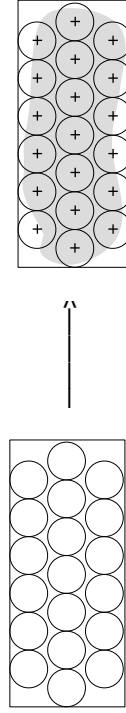


DATIVE COVALENT (CO-ORDINATE)

- consists of a **shared pair of electrons, both electrons from one atom**
- one species is a lone pair donor - LEWIS BASE
- other species has space in outer shell to accept a lone pair - LEWIS ACID
- once the bond has been formed it is the same as a covalent bond

METALLIC

- metal atoms arranged in regular lattice give up outer shell electrons
- electrons form a mobile 'cloud' which binds metal ions together



- strength of bond depends on number of electrons and size of ions
- mobile electrons ... allow electricity to be conducted