They dissolve in polar solvents, such as water, because the positive ions are attracted to the electronegative oxygen and the negative ions are attracted to the electropositive hydrogen atoms of the water molecule. This breaks down the giant ionic lattice as the water molecules surround and pull the ions away from the lattice and cause it to dissolve.

They are good electrical conductors when molten because the ions are mobile and can carry charge. When solid, they can't conduct electricity because the ions are fixed in position by the strong ionic bonds and aren't mobile.

Covalent bonding

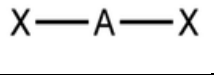
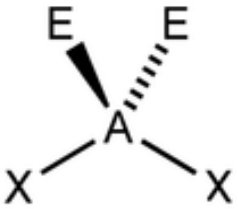
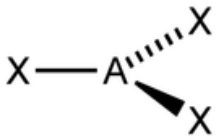
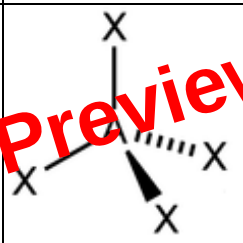
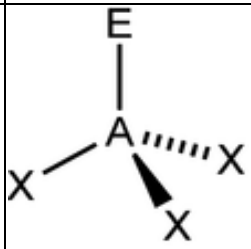
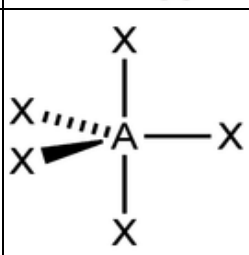
Covalent bonding is the electrostatic attraction between a shared pair of electrons and the nuclei of the bonded atoms.

The attraction overcomes the repulsion between the two positively charged nuclei resulting in a covalent bond.

It is directional, acting solely between two atoms involved in the bond.

Average bond enthalpy is the measurement of covalent bond strength. The large the average bond enthalpy, the stronger the covalent bond.

The shapes of simple molecules and ions

Name of shape	Diagram of shape	Bond angles	No. of outer electrons and lone pairs	Examples
Linear		180°	2 bond pairs and no lone pairs	$BeCl_2$
Non-linear		104.5°	2 bond pairs and 2 lone pairs	H_2O
Trigonal planar		120°	3 bond pairs and no lone pairs	BF_3
Trigonal pyramidal		107°	3 bond pairs and 1 lone pair	NH_3, $SbCl_3$
Tetrahedral		109.5°	4 bond pairs and no lone pairs	CH_4
Trigonal bipyramidal		90° and 120°	5 bond pairs and no lone pairs	PF_5
Octahedral		90°	6 bond pairs and no lone pairs	SF_6

Relative repulsive strengths: **Lone** pair/**Lone** pair > **Bonded** pair/**Lone** pair > **Bonded** pair/**Bonded** pair