

Factors affecting bond formation

Octet rule & stability

Atoms tend to form bonds to achieve a stable configuration usually (8 electrons in the outer shell). Noble gases are stable b/c they already have ^{complete} octets.
eg NaCl forms b/c Na loses one electron and Cl gains one to complete octet.

Electronegativity

The tendency of an atom to attract shared electrons.
Large difference in electronegativity $\rightarrow$ ionic bond.
Small difference $\rightarrow$ covalent bond.

eg Na (low EN) + Cl (high EN) $\rightarrow$ ionic bond.

Ionisation energy & electron affinity

IE $\rightarrow$ Energy required to remove an electron

low IE $\rightarrow$ atoms easily lose electrons (metals)

EA $\rightarrow$ Energy released when an atom gains an electron.

High IE $\rightarrow$ atom easily gains electrons (non metals)

Both favor bond formation when IE is low & EA is high

Lattice energy (for ionic bonds)

Energy released when oppositely charged ions come together to form a solid lattice.

High lattice energy $\rightarrow$ stronger ionic bond.

It depends on

Charge of ions (greater charge $\rightarrow$ stronger bond)

Size of ions (smaller ions $\rightarrow$ stronger bond)