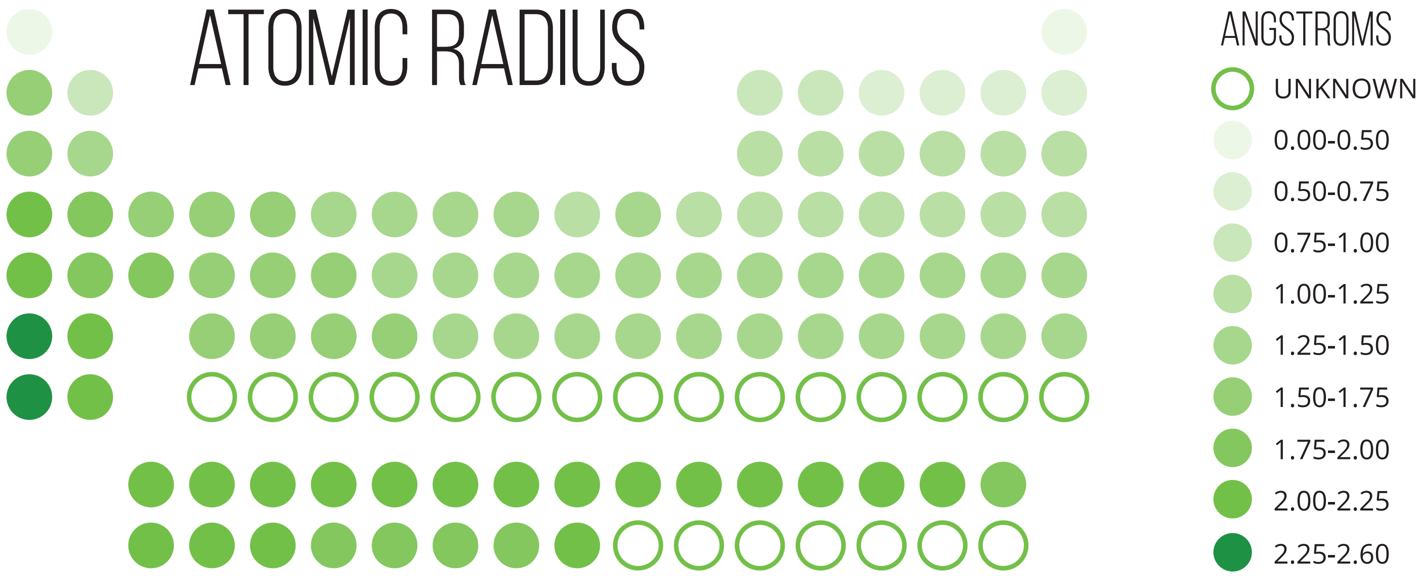
TRENDS IN THE PERIODIC TABLE

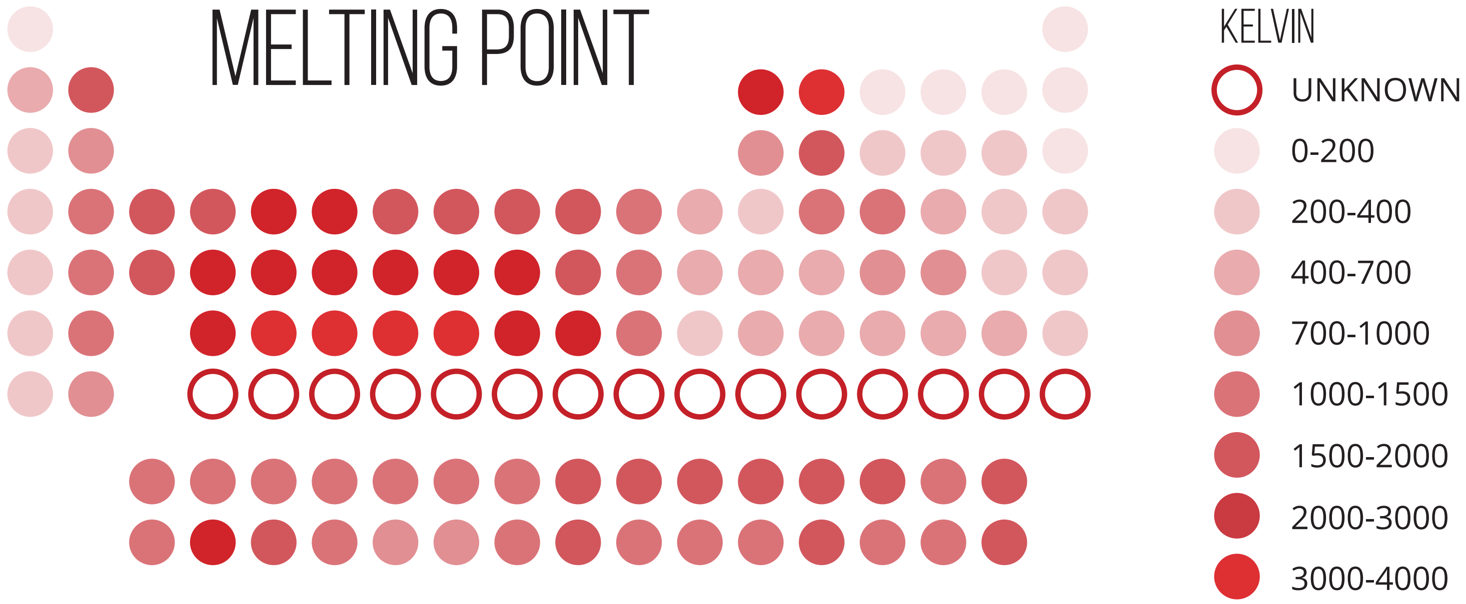
ATOMIC RADIUS



Atomic radius increases across a period as nuclear charge increases but shielding effects remain approximately constant, resulting in electrons being drawn closer to the nucleus.

Atomic radius decreases down a group as valence electrons become increasingly distant from the nucleus, and shielding also increases. This leads to a decrease in atomic radius despite the increasing nuclear charge down a group.

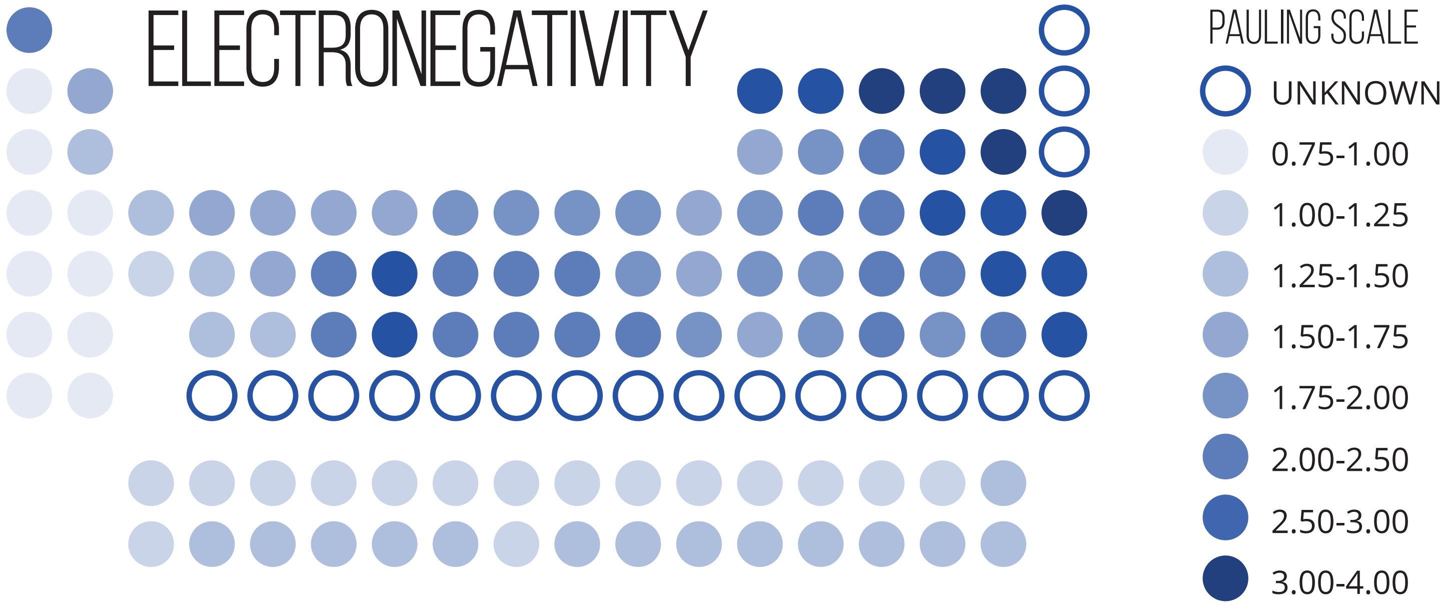
MELTING POINT



Metallic bonded and macromolecular substances tend to have high melting points. For both, this is due to the fact that the bonds require a lot of energy to break.

The majority of non-metals have a simple molecular structure. Simple molecular substances have low melting points as only weak intermolecular forces must be overcome in order to melt them. Strength of these is determined by the size of the molecule.

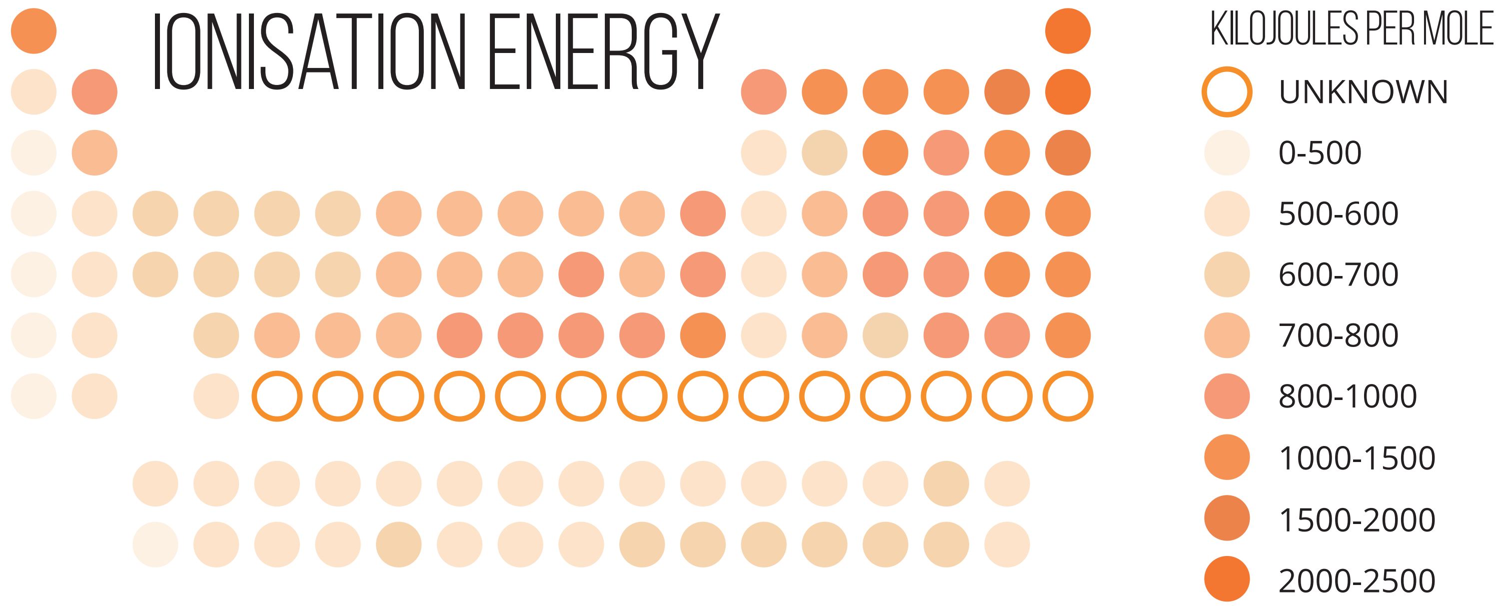
ELECTRONEGATIVITY



Electronegativity is a measure of the tendency of an atom to attract a bonding pair of electrons. Generally, electronegativity increases moving towards the top right of the Periodic Table.

This increase in electronegativity across a period is due to the increased nuclear charge and approximately constant shielding effects resulting in a greater force of attraction to the nucleus of the atom felt by the bonding electrons.

IONISATION ENERGY



The first ionisation energy generally increases from left to right across a period, as the electron is drawn closer to the nucleus by the increased nuclear charge and becomes harder to remove.

Electrons in p orbitals are slightly easier to remove than those in s orbitals of the same energy level. Paired electrons in the same orbital can lead to repulsion, again making an electron easier to remove. Both of these factors can lead to lower than expected first ionisation energies.