

Atomic Size

Atomic size increases down the group. The addition of electrons shells, increases distances between nucleus and valence electrons.

Atomic size decreases from left to right across the period. With an increase in nuclear charge, the attraction of electrons to the nucleus becomes stronger. Consequently, the atom's shell pulled closer to the nucleus.

Electronegativity / Electron Affinity

(Measure of an atom's ability to attract shared electrons to itself)

(The amount of energy released when an electron is added to a neutral atom to form an anion)

(Electropositivity)

Electronegativity decreases as the atomic size increases while ionisation energy decreases down the group. Electrons attractions towards the nucleus gets weaker with distance. Valence electrons more easily lost to atoms in reaction.

Ionization Energy (amount of energy required to remove an electron from an atom or molecule)

Electronegativity increases from left to right across the period as atomic size decreases while ionisation energy increases. With an increase in nuclear charge, the attraction of electrons to the nucleus becomes stronger. Consequently, valence electrons are less likely to be lost to other atoms or gain electrons during a reaction.

Ionic Radius

Ionic size increases down the group. The addition of electrons shells, increases distances between nucleus and valence electrons.

Ionic size decreases from left to right across the period. With an increase in nuclear charge, the attraction of electrons to the nucleus becomes stronger. Consequently, the atom's shell pulled closer to the nucleus.

*More positive charge, smaller the ionic size

*More negative charge, bigger the ionic size.

Example:

$\text{Na}^+ > \text{Na}$

Has less number of shells occupied by electrons compared to Na

$\text{Br}^- > \text{K}^+$

Addition of electrons causes increase in electron-electron repulsion resulting in bigger electron clouds while K^+ lose an electron. K^+ has less number of shell occupied by electrons in ionic state compared to Br^- .

$\text{Cl}^- > \text{Cl}$

Addition of electrons causes increase in electron-electron repulsion resulting in bigger electron clouds.