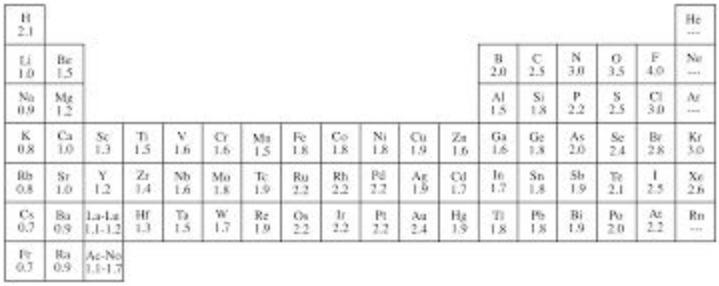
Electronegativity

The measure of the tendency of an atom to attract a bonding pair of electrons.

Pauling Scale



Covalent Bond If the electronegativity difference (ΔEN) is less than 0.5.

Polar Covalent Bond If the ΔEN is between 0.5 and 1.6

Ionic Bond If the ΔEN is greater than 2.0

A "spectrum" of bonds

The implication of all this is that there is no clear-cut division between covalent and ionic bonds.

In a pure covalent bond, the electrons are held on average exactly halfway between the atoms.

In a polar bond, the electrons have been dragged slightly towards one end.

How far does this dragging have to go before the bond counts as ionic?

There is no real answer to that.

You normally think of sodium chloride as being a typically ionic solid, but even here the sodium hasn't *completely* lost control of its electron.

Because of the properties of sodium chloride, however, we tend to count it as if it were purely ionic.

Trends in the Periodic Table

Remember Coulomb's Law???

Draw the Bohr Diagrams for **Li** to **Na** to **K** in Group 1 A as they appear in the PT:

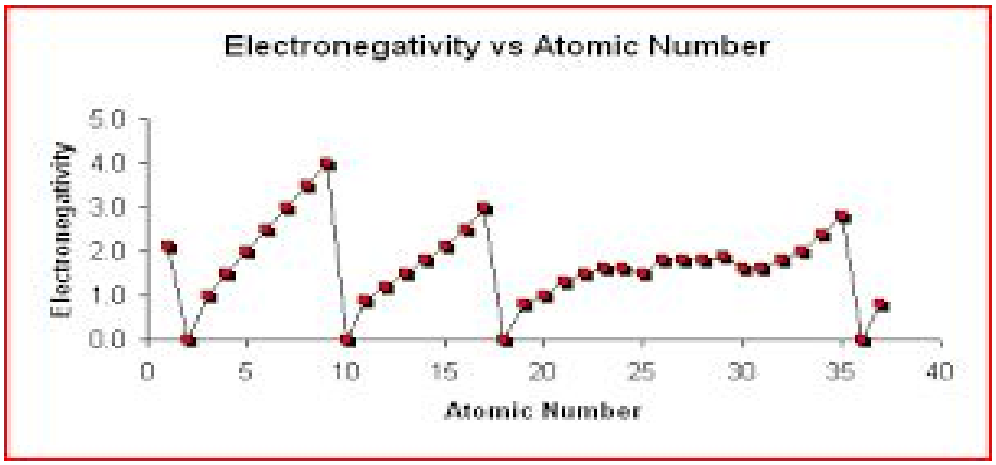
Li

Na

K

Draw the Bohr Diagrams for Na to Mg to Al across Period 3 as they appear in the PT:

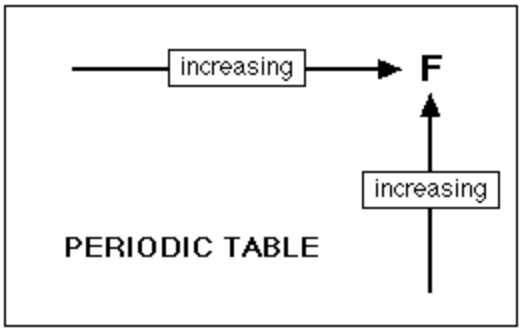
Na **Mg** **Al**



Describe what happens to electronegativity from the above graph:

Explain why this happens to electronegativity down a group:

Explain why this happens to electronegativity across a period:



There are other trends in the PT.

Atomic Radius