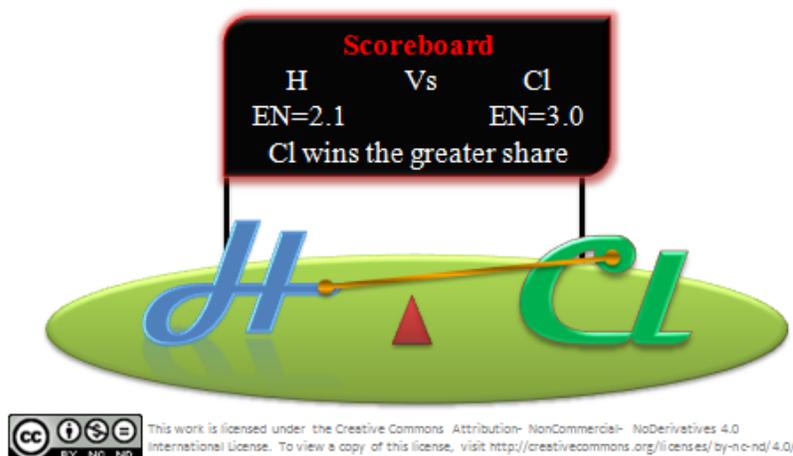


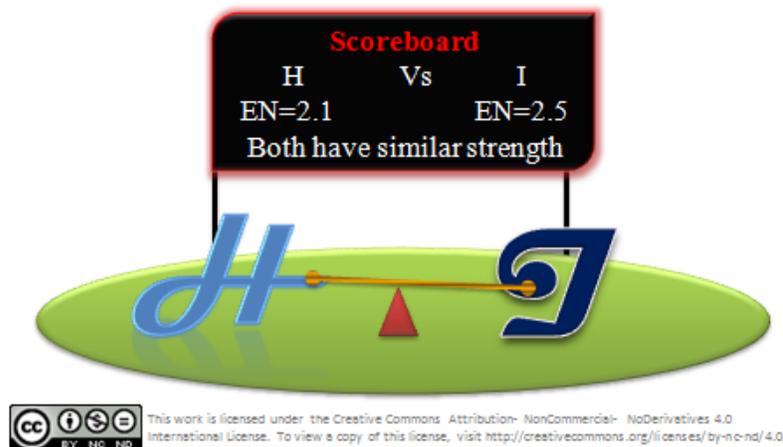
PERIODIC PROPERTY: ELECTRO NEGATIVITY

We have learnt about the atom and discussed different qualities of elements like size, ionization enthalpy and electron gain enthalpy. Up till now we have studied an isolated element as it exists alone. When an element makes bond with other element, its other qualities are surfaced and it behaves differently in response to the changed environment.

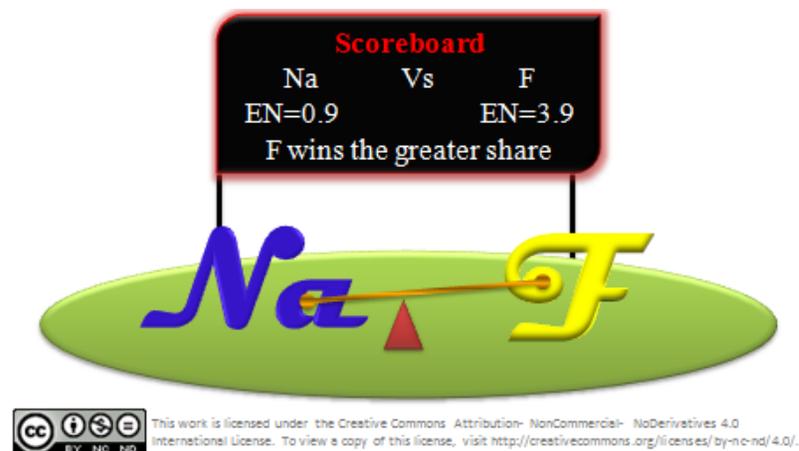


Like when a child interacts with the other children for the first time, his personality is explored, either he dominates others or is dominated by others or may become a believer of equality. Similarly when an element makes a bond with other element, its hidden qualities appear. Electro negativity is one of such qualities.

When two atoms make bond with each other they share bonding electrons but there is always a fight over getting a greater share of bonding electrons. Each of bonded atoms tries harder to pull bonding electrons towards it to get the major share. It is the game of strength and whichever has the greater strength to pull bonding electrons, wins and gets the greater share of it. This strength is called the Electronegativity.



Electronegativity (EN) is the tendency of an atom to pull bonding electrons toward itself. As in case of water molecule, Oxygen atom pulls bonding electrons.

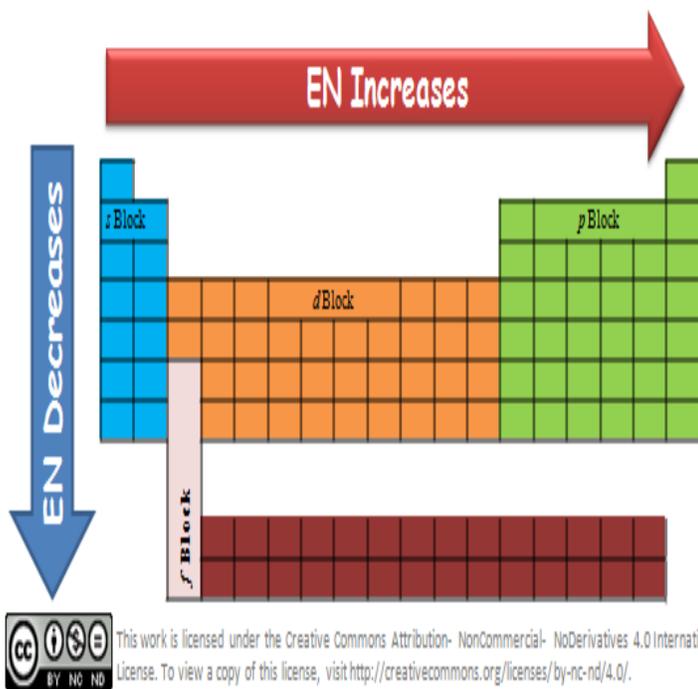


In 1930, scientist Pauling defined electronegativity of an atom as the tendency of the atom to attract electrons to itself when combined in a compound. This quality of element also depends on the atom and its characteristics.

- **Size of the atom:** In a smaller atom orbits are placed closely to the nucleus as compared to a larger one. So the nucleus is able to attract bonding electrons effectively.
- **Nuclear charge:** Large nuclear charge can attract bonding electrons effectively.

- **Shielding effect:** How effectively the inner sub-shells shield the outer electrons (shielding effect $s > p > d > f$). Strong shielding defends outer electrons from the nuclear attraction while, weak shielding enables nucleus to attract outer electrons as well as bonding electrons more powerfully.
- **Electronic configuration:** Half filled and fulfilled sub-shells have extra stability. Elements those are nearing their half filled or full filled configuration have strong desire to get possession on bonding electrons so that they can achieve stable configuration.

When you go downwards in a column, the number of protons increases which make nucleus stronger, but atomic size also increases, which diminishes the power of nucleus. So, it becomes difficult for nucleus to attract bonding electrons. You will find elements on the bottom of a column are less electronegative as compare to the elements on the top.



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When you go towards right in a row, size/ radius of the atoms decreases. Increasing number of protons makes nucleus stronger. As the number of orbits remains same in a row, it becomes easier for nucleus to attract bonding electrons. That's why; elements on the right end of a row are more electronegative than the elements on the left end.

Electronegativity is a relative quality that's why it has no unit. The electronegativity values we are referring today's are derived by Pauling. According to the Pauling scale group 1 has lowest EN value and group 17 has highest EN value.

EN plays important role in deciding the nature of bond. In next post will see how EN decides the nature of bond.

Source : <http://chemistrynotmystery.blogspot.in/2014/07/periodic-property-electro-negativity.html>