Electronic theory of Valency

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Valence electron

It is defined as **number of electron present in outermost orbit** or shell of an atom of an element.

For eg:

1)Na (Sodium) Z=11 (2,8,1)

Valence electron is **1**

2)Mg (Magnesium) Z=12 (2,8,2)

Valence electron is **2**

3)Al (Aluminium) Z=13 (2,8,3)

Valence electron is **3**

Definition of Valency

It is defined as number of electron **loosed,or gained,or shared** by an atom of element to become stable by achieving octet state.

Examples

Sodium (Na) 11

2,8,1

It has one electron so it is unstable ,it gets stable by losing a electron and become sodium ion with a positive charge hence it is called as an electropositive ion

Na ----------> e^- + Na^+

(2,8,1) (2,8)

Other Electropositive ion

Magnesium

$Mg \text{ ----------> } 2e^{-} + Mg^{+2}$

(2,8,2) (2,8)

Aluminium

$Al \text{----------> } 3e^{-} + Al^{+3}$

(2,8,3) (2,8)

Conclusion

Therefore

Sodium has positive Electrovalency +1

Magnesium has positive Electrovalency +2

Aluminium has positive Electrovalency +3

This all are examples of **Positive Electrovalency** which is achieved by losing electron

Valency achieved by gaining of electron

Phosphorus (15) (2,8,5)

$P + 3e^{-}$ ---------- P^{-3}

(2,8,5) (2,8,8) Negative Electrovalency of -3

Sulphur (16) (2,8,6)

$S + 2e^{-}$ ----------> S^{-2}

(2,8,6) (2,8,8) Negative Electrovalency of -2

More examples

Chlorine (17) (2,8,7)

$Cl + 1e^- \text{----------} > Cl^-$

(2,8,7) (2,8,8) Negative Electrovalency of -1

Thus Phosphorus,Sulphur and Chlorine are examples of **Electronegative ion** because they have negative electrovalency which is achieved by **gaining** electron.

Carbon

C (6) (2,4)

Carbon prefers Sharing its 4 electron with other carbon atom so that it can achieve its stability

Hence its Valency will be **4**

covalency

Questions

1) What is valence electron.
2) Define Valency.
3) Why Sodium is electropositive atom.
4) Why chlorine is Electronegative atom.
5) Positive ions are called _____.
6) Positive ions are formed by _____ of electron.
7) Negative ions are called as _____
8) Negative ions are formed by _____ of electron.