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## INERT PAIR EFFECT

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# PREREQUISITE

- P-block elements
- Properties variation in p-block elements

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# LEARNING OUTCOMES

- Knowledge of various oxidation states in a group
- Order of shielding effect

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# INERT PAIR EFFECT

- The term inert pair effect was first proposed by Nevil Sidgwick in 1927.
- The tendency occur among heavy elements in the p-block and is called the inert pair effect.
- Inert pair effect is the resistance or reluctance of s-electrons to get unpaired or take part in covalent bonding.
- It is only p orbitals electrons which are involved in bond formation.

Inertness of 's' electron due to shielding effect.

Inner d or f  
orbital.

outer 's'  
electron

Nucleus

Sn

e<sup>-</sup> 's'-electron.

The order of shielding  
effect of orbitals ,  
 $s > p > d > f$

Outer 's'  
orbital



- In term inert pair effect is often used in relation to the increasing stability of oxidation states that are two less than the group valency for the heavier elements of group 13,14,15,and16.

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# Different Oxidation state

- Group 13 elements (Boron family)
- .Group 14 elements (Carbon family)
- .Group 15 elements (Nitrogen family)
- Group 16 elements (Oxygen family)

# APPLICATION

- . ELECTRONIC CONFIGURATION
- . ATOMIC RADII
- . IONISATION ENTHALPHY
- . ELECTRONEGATIVITY

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THANK YOU

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