

***Chapter 1***  
***Introduction***

**Arrhenius definition:**

Acids give off proton  $H^+$  and bases generate  $OH^-$  when dissolved in water.

**Brønsted-Lowry Definition:**

Acids as proton donor and bases as proton acceptor, include uncharged and ionic species.

**Lewis Definition:**

Acids are electron acceptors and bases are electron donors.

Organic groups with polarizable multiple bonds such as carbonyl, cyano, nitroso regarded as Lewis bases.

Besides anions, molecules with lone-pair electrons and  $\Pi$ - electron systems are bases.

## The Hard and Soft Acid and Bases (HSAB) Concept: Historical Development:

The principle was applied to inorganic coordination compounds and organic molecules and even electrode and catalytic phenomena.

Pearson and Edwards in 1961 began this work. Pearson first paper is published in 1963 and in this article propounded that *“hard acids bind strongly to hard bases and soft acids bind strongly to soft bases”*.

First symposium on HSAB was sponsored by Cyanamid European Research Institute in Geneva in May 1965. Two years later, the second symposium celebrated in London.

In 1967 another paper by Pearson and Songstad is published, applying the HSAB principle to organic chemistry. Saville published a full account of his analysis of multicentered reactions based on the HSAB principle. Clopman presented a perturbation treatment of chemical reactivity and the related HSAB to molecular orbital theory.