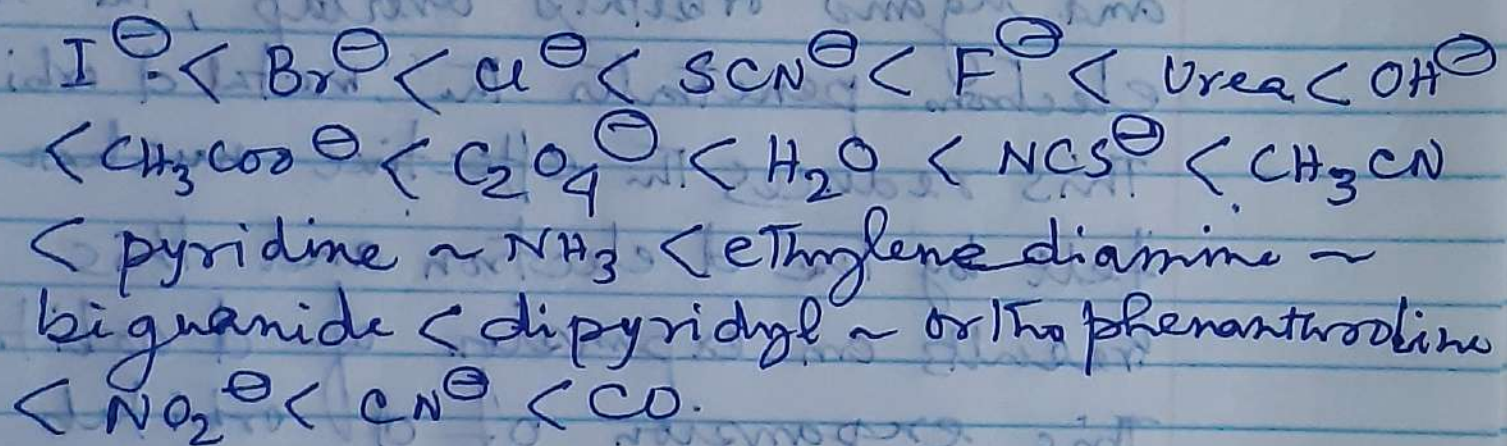
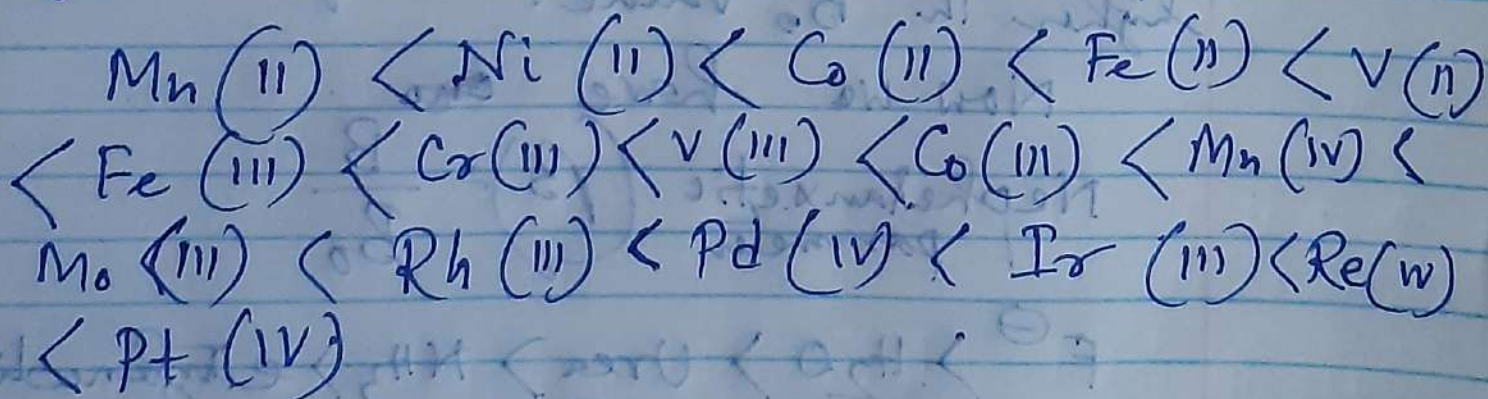


## Spectrochemical Series :-

The electronic Spectral Studies of a large number of octahedral Complexes with a variety of co-ordinating ligands have led to a serialization of the ligands in order to increasing  $10 Dq$ . This series of ligands, known as the Spectrochemical series for a given metal.



For a given ligand and a given stereochemistry, the spectrochemical series of metal ions is





An analysis of the electronic transition in a complex allows us to make an estimate of interelectronic Racah parameter  $B$ . The value of  $B$  is always less than free ion  $B_0$  value.

The reduction of  $B$  values can be explained by metal ligand interaction mechanism. When the metal  $d$  orbitals and ligand orbitals overlap, the ligand electron penetrates the metal  $d$  orbital.

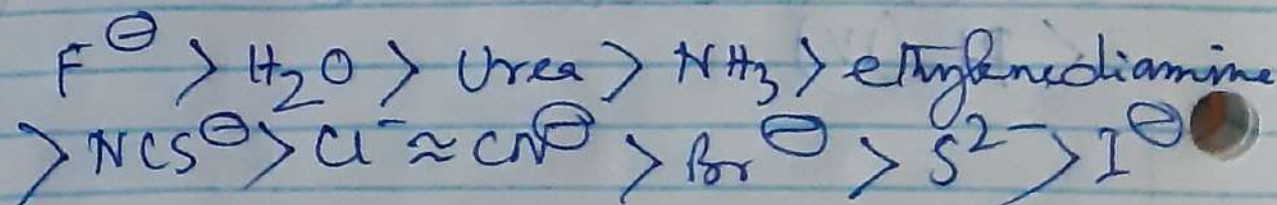
This reduces the effective nuclear charge felt by the  $d$  electron and this results in an expansion of  $d$  orbitals.

This expansion of  $d$  orbitals effectively increases the separation of  $d-d$  orbitals.

As a result interelectronic repulsion decreases. It is understandable that higher the oxidation state of a metal ion higher the  $B_0$  value.

Now we have

Nephelauxetic parameter  $(\beta) = \frac{B}{B_0}$



This series is called Nephelauxetic series.