Selection rule

DATE

According to Bohr Theory Electronic transition takes place from one energy level to another energy level. Now we will study which transition is allowed and which is not allowed.

If transition is allowed possible then it is called allowed transition otherwise Forbiden transition

Selection rule:—

1) If $\Delta n = \pm 1, \pm 2, \pm 3, \pm 4 \ldots\ldots$ then transition is allowed.

n = Energy level.

2) Transition from orbital is called Laporte transition.

$s - p - d - f$.

transition from $s-p$, $d-f$, $p-d$ is allowed

In d-d transition Laporte forbidden transition intensity is low to make high intensity p-d mixing DATE takes place. transition from s → d

s - f

p - f not allowed.

means: $\Delta l = \pm 1$ d-d transition is f-f → Laport forbidden.

3) If $\Delta s = 0$ then transition is allowed means if electron transfer from one energy level to another energy level spin does not change. If $\Delta s = 0$ then spin multiplicity 0

$2S+1$

L_S

then transition is allowed.

$3T_2$ $3T_2$ allowed.

$L_{2/3}$ $L_{3/5}$

then transition is

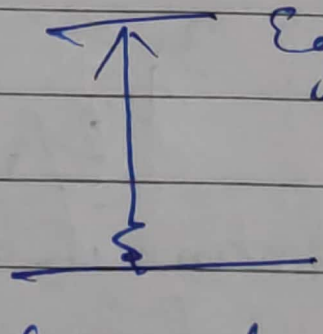
Singlet → Singlet.

Doublet → Doublet.

Triplet → Triplet.

4) Total orbital angular momentum $\Delta J = 0, \pm 1$)
J value obtained from L-S coupling therefore for allowed transition difference in conjecture J value should be ± 1

5) Δm_J should be $0, \pm 1$ If magnetic field is applied in a complex then splitting takes place. octahedral complex d orbital split into t_{2g} + E_g



then Δm_J value obtained. should be $0, \pm 1$

6) Symmetry forbidden transition takes place in molecular orbital.

$\sigma \rightarrow \sigma^*$ allowed.

$\pi - \pi^*$ allowed.

$\sigma \rightarrow n$
$\sigma - \pi$
$\pi - \sigma$
} forbidden transition.