TERM SYMBOL

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TERM SYMBOL

❖ coupling between two non equvalent electrons
❖ when the electrons are interacting a new energy levels are formed –term symbol
❖ when the two electrons are interacting total strength will be the capital "S".

S = 0 or 1

½ + ½ = 1

1/2 - 1/2 =0

The term symbol formula $2s+1_L$

J

❖ S   = Total spin

❖ 2s+1 = spin multiplecity

❖ L   =Total angular momentum

❖ J   =Total spin and angular

momentum

For example

□ p^2 system ground state term symbol is $3p_0$

□ p^4 system ground state term symbol is $3p_2$

- $3p_2 \ 3p_1 \ 3p_0$
- so much energy levels are available any one of the term lower in engry called the ground state
- if various energy levels- Hunt's rule will arrange the terms –increasing order of energy.
- highest multiplecity should be the lower in energy

❑ if two terms of same multiplecity are available then the highest "L" value will be the lower in energy.

❑ when the multiplecity is same then the "L" value same,

❑"J" value will decide the energy of the system

❑< than ½ filled   lowest "J" Value will be the lower in energy

❑> than ½ filled   highest "J" Value will be the lower in energy

MICROSTATES

◆   no of microstates = $n!/r!(n-r)!$

◆ n = twice the no of orbitals

◆ r= no of electrons

◆ p1 = 6

◆ p2 = 15

◆ d1 = 10

◆ d2 = 45

◆ d3 = 125

TERMS AND MULLIKEN

- S - A_1g
- P - T_1g
- D - $T_2g +Eg$
- F - $T_1g +T_2g +A_2g$
- G - $A_1+Eg+T_1g+T_2g$
- H - $Eg+T_1g+T_1g+T_2g$
- I - $A_1g+A_2g +Eg +T_2g +T_1g+T_2g$