

Selection rules

(determine intensities)

Laporte rule

$g \rightarrow g$ forbidden (that is, d-d forbidden)

but $g \rightarrow u$ allowed (that is, d-p allowed)

Spin rule

Transitions between states of different multiplicities forbidden

Transitions between states of same multiplicities allowed

These rules are relaxed by molecular vibrations, and spin-orbit coupling

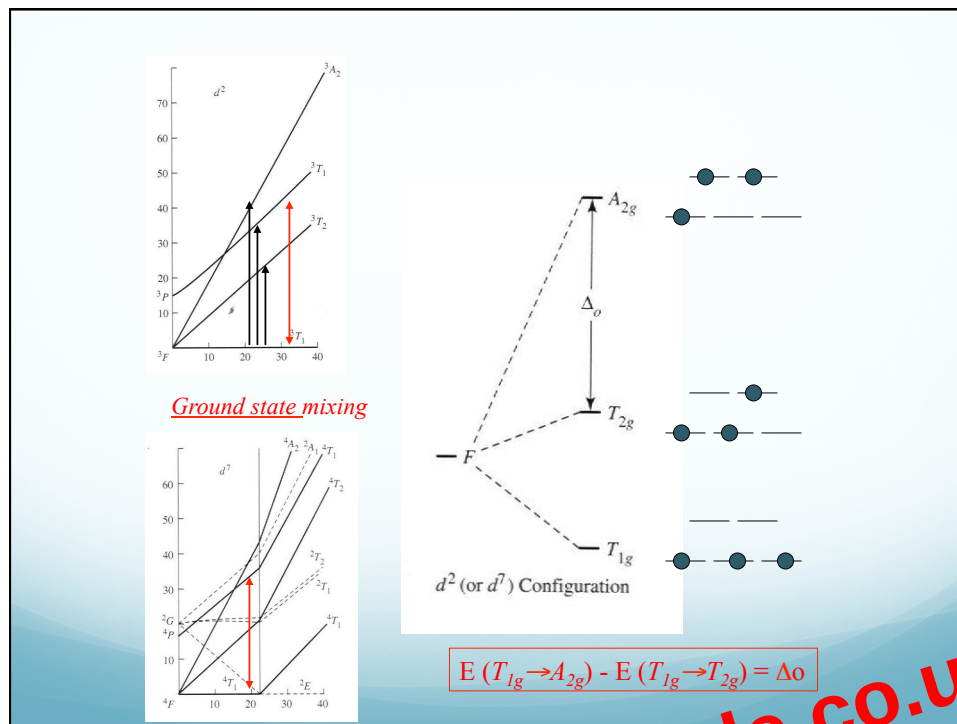
Preview from Notesale.co.uk
Page 11 of 18

Group theory analysis of term splitting

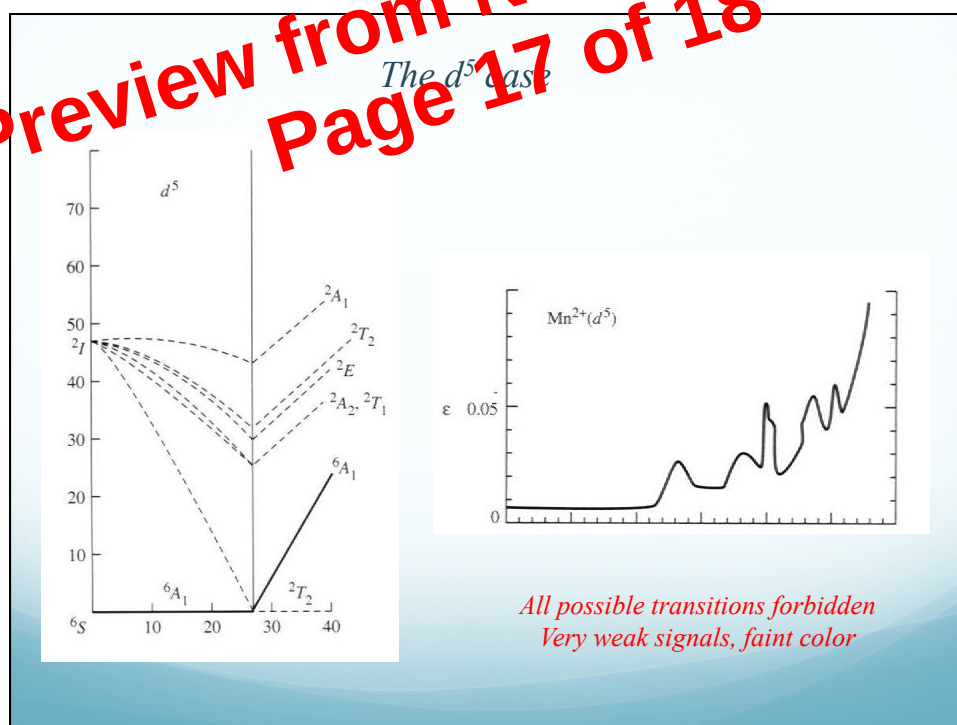
TABLE 11-6

Splitting of Free-ion Terms in Octahedral Symmetry

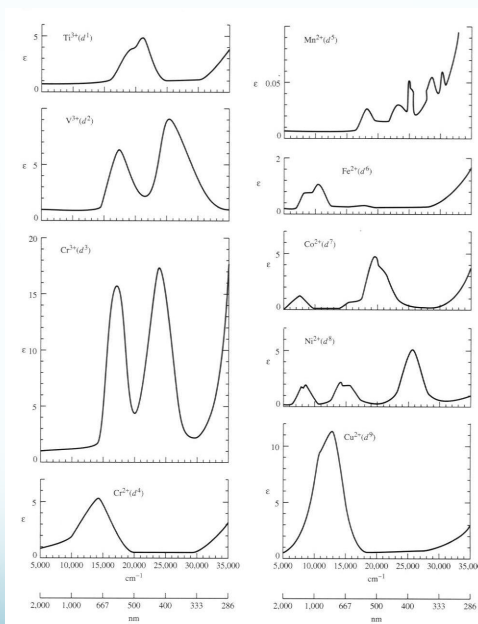
Term	Irreducible Representations
<i>S</i>	A_{1g}
<i>P</i>	T_{1g}
<i>D</i>	$E_g + T_{2g}$
<i>F</i>	$A_{2g} + T_{1g} + T_{2g}$
<i>G</i>	$A_{1g} + E_g + T_{1g} + T_{2g}$
<i>H</i>	$E_g + 2T_{1g} + T_{2g}$
<i>I</i>	$A_{1g} + A_{2g} + E_g + T_{1g} + 2T_{2g}$



Preview from Notesale.co.uk
 Page 17 of 18

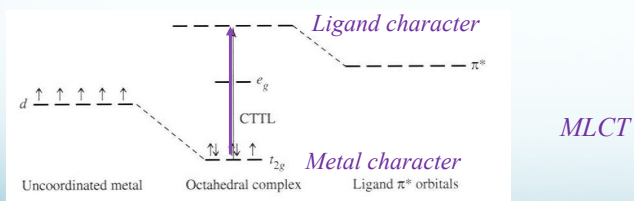
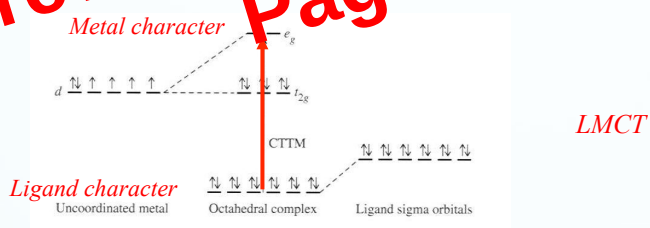


Some examples of spectra



Preview from Notesale.co.uk
Page 18 of 18

Charge transfer spectra



Much more intense bands