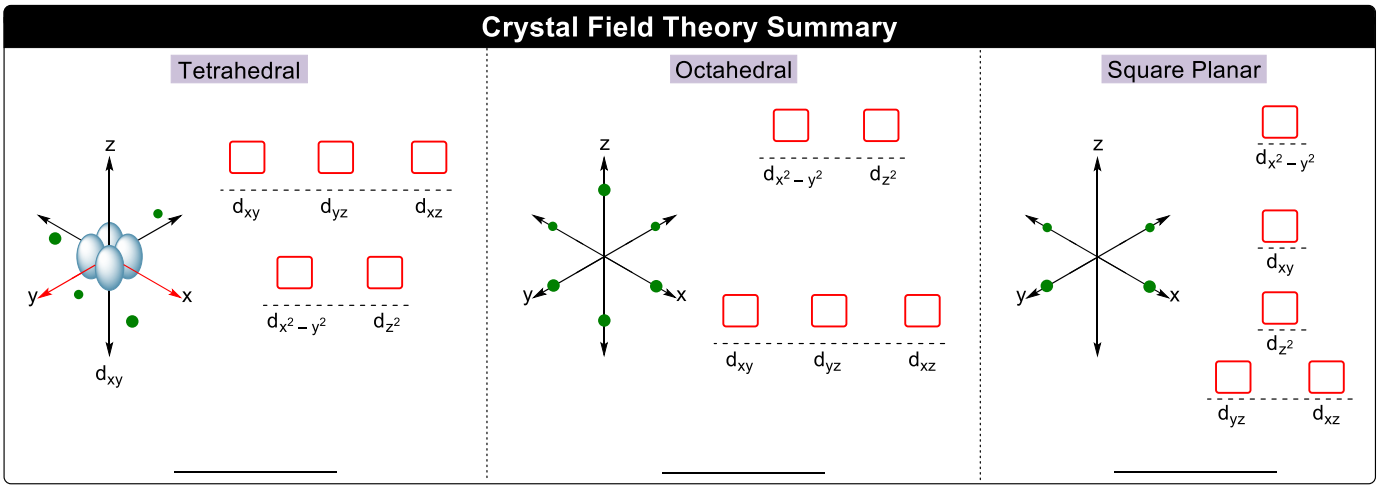
CONCEPT: CRYSTAL FIELD THEORY SUMMARY

- Splitting patterns for d orbitals in complexes depend upon their _____.
  - □ Orbitals with the _____ interactions with ligands have the greatest increase in energy.



- Δ tetrahedral < Δ octahedral < Δ square planar

EXAMPLE: Which one of the following complexes has the smallest crystal field splitting energy?

a) $[Cr(en)_3]^{3+}$

b) $[CuF_4]^{3-}$

c) $[Co(H_2O)_6]^{3+}$

d) $[Pt(NH_3)_2Cl_2]$

PRACTICE: What is the correct order when the following complexes are arranged in ascending order of the Δ values?

i) $[Mn(NO_2)_6]^{4-}$ ii) $[Ni(CN)_4]^{2-}$ iii) $[Zn(OH)_4]^{2-}$

a) i < ii < iii

b) ii < i < iii

c) ii < iii < i

d) iii < i < ii