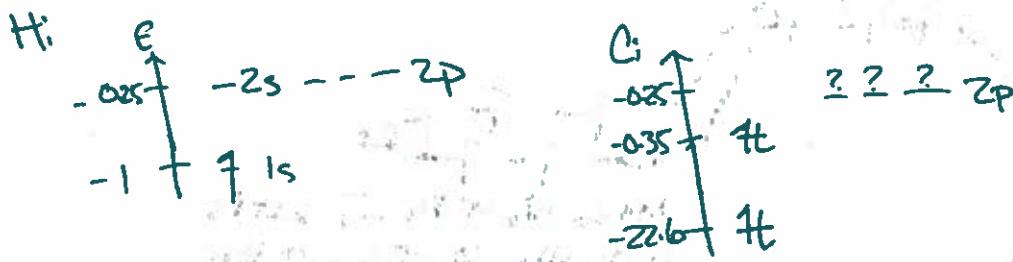
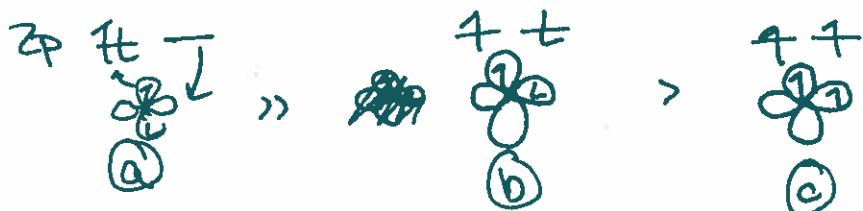


Hund's Rules



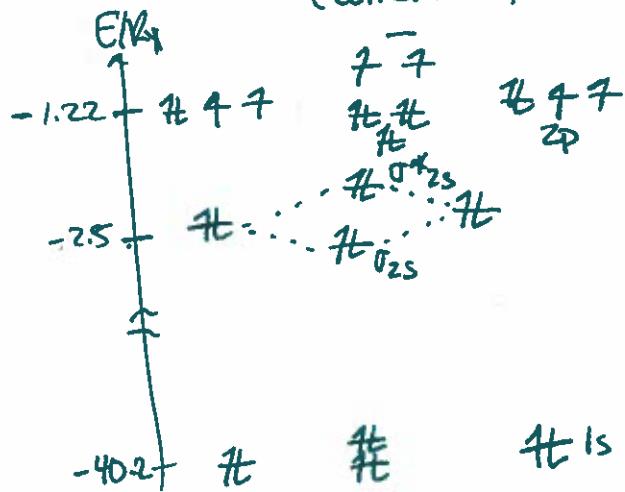
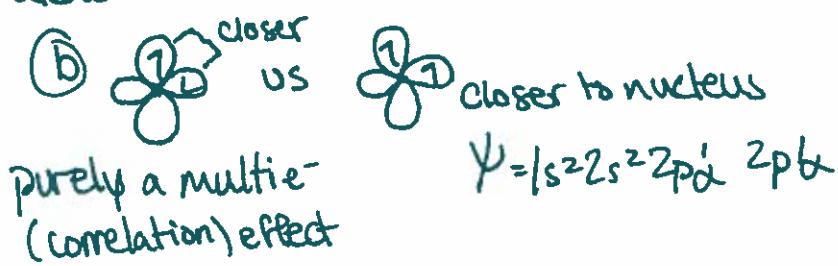
Hund's rules



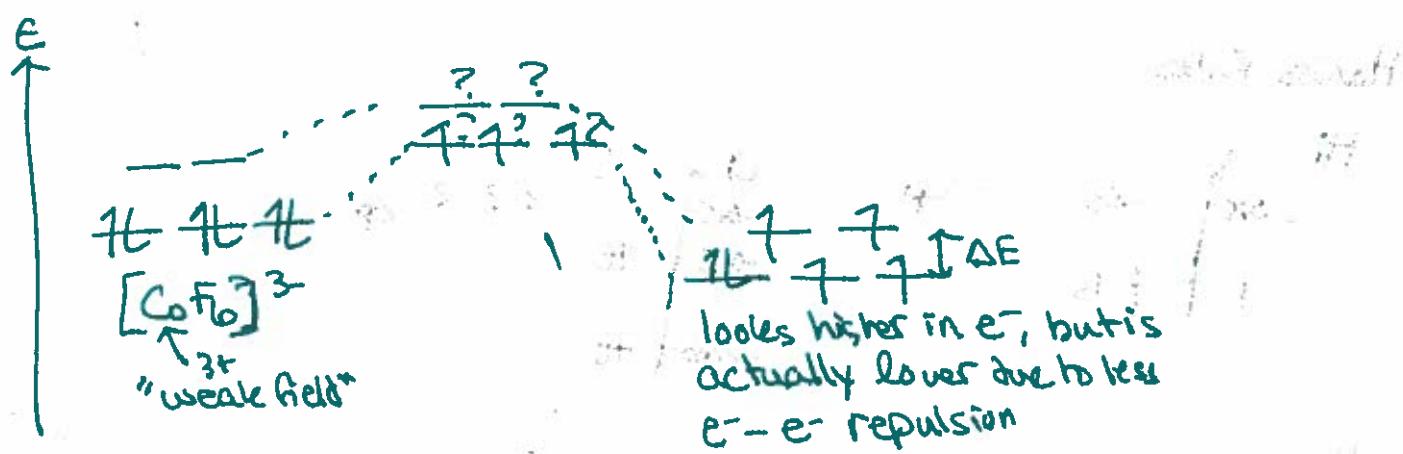
- (b) has lower $e^- - e^-$ repulsion \rightarrow lower (r_{12}) than (a) ~~different~~
- (c) lower $e^- - e^-$ repulsion than (b) ... why?

↳ Pauli exclusion
 $\psi(c) \rightarrow 0$ faster than
 $\psi(b)$ when $r_{12} \rightarrow 0$

Thus the e^- shield each other less $\rightarrow Z_{\text{eff}}$ is larger and the smaller orbitals are lower in e^-



\downarrow $S=1, M_S=0 \pm 1$
 ground state
 $M_L = M_{L1} + M_{L2}$
 $= \pm 1 \pm 1$
 $= 0$ (lowest E)



Because the t_{2g} orbital has a higher energy than the e_g orbital,

the $t_{2g}^3 e_g^2$ configuration is more stable than the $[Co^{f_6}]^3$ configuration.

Electron spin

Pauli principle

Electron spin

Electron spin does not affect the total spin quantum number, but it does affect the total angular momentum.

$S = 1/2$ (one spin up, one spin down)

Electron spin
antiparallel

Electron spin

$S = 1$

$S = 1$