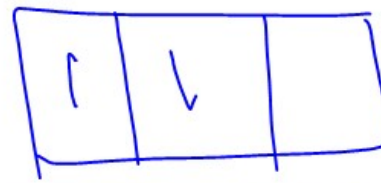




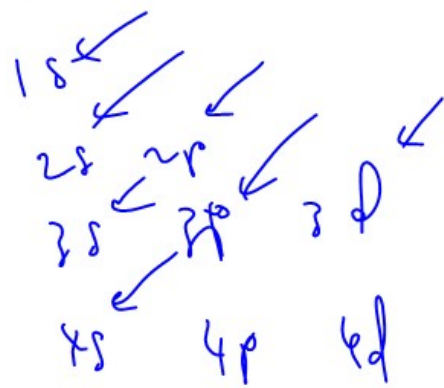
① Repulsion / pairing [↑] ↑



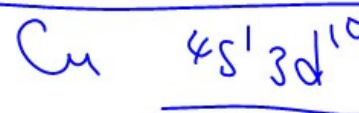
exchange energy $\ominus$



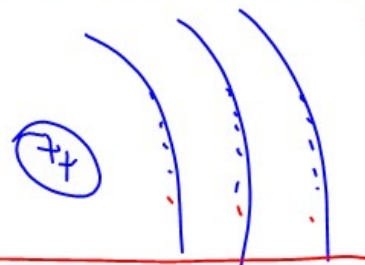
Hund's Rule
higher multiplicity more stable



≥ 30 $\uparrow$ s
higher
than 3d



Screening/Shielding



Slater's Rules

⑤ $(Z - S) = Z_{\text{eff}}$

1s 2s 2p 3s 3p 4s 3d $\times$

① $(1s) \quad (2s, 2p) \quad (3s, 3p) \quad (3d) \quad (4s, 4p) \quad (4d) (4f)$

② to the right / zero shielding

③ S value for a given e^- in (ns or np) is :

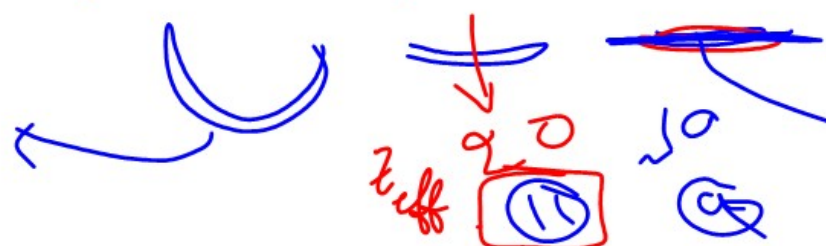
→ each e^- in same group shield by 0.35

→ each e^- in (n-1) groups shields by 0.85

→ each e^- in (n-2) groups or lower shields by 1.00



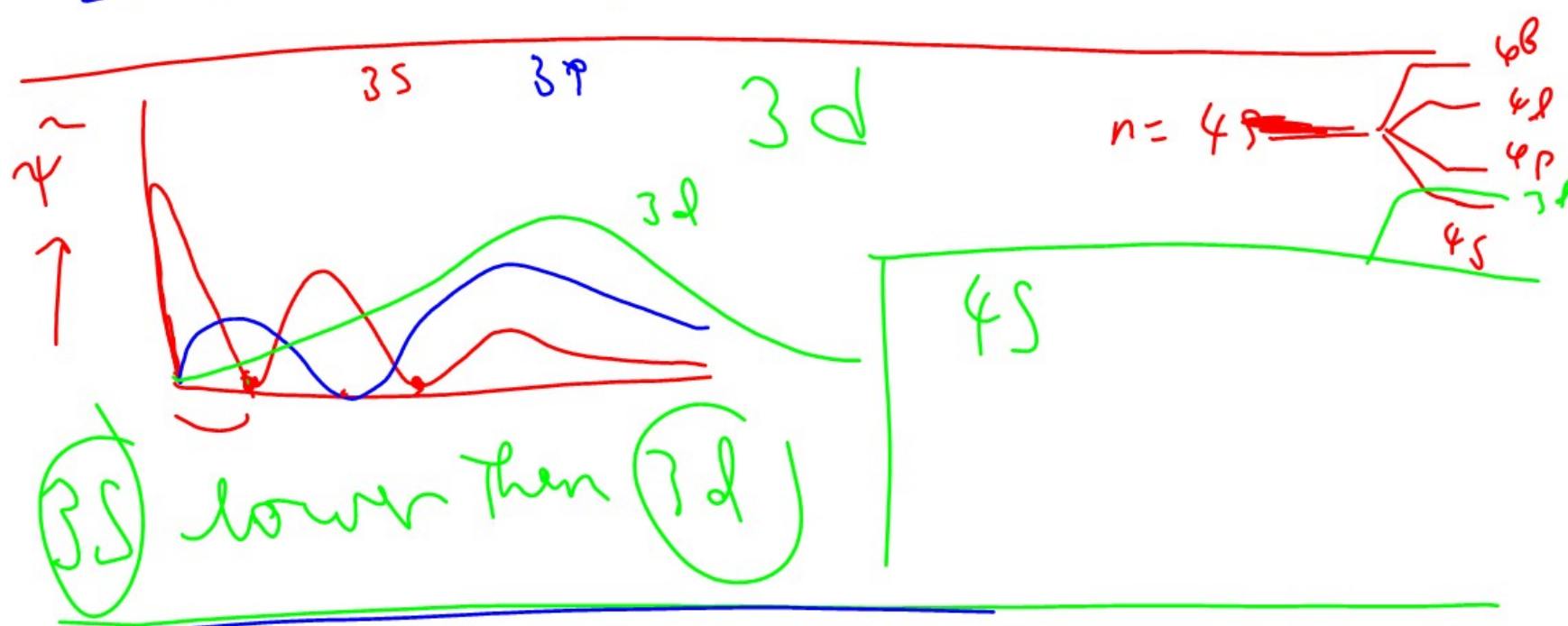
$$z_{eff} = 14$$



$$z_{eff} = 31 - 17 = 14$$

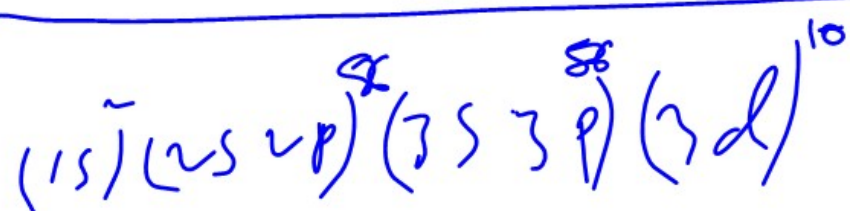
$$S = 21.5$$

$$z_{eff} = 9.85$$



N_i	$4s^2 3d^8$
N_i^{2+}	$4s^0 3d^8$

When forming a $\oplus$ ion overall e^- repulsion is lowered
this lowering in the d is more pronounced than in s



N_i

nd or n f e

→ each e in same group shield
by 0.35
→ each e to the left shield
by 1.00
