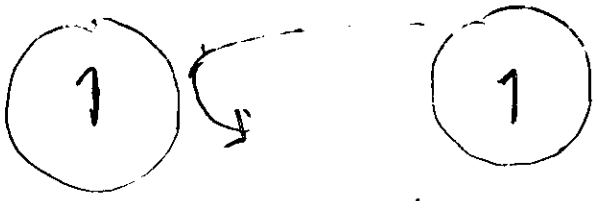


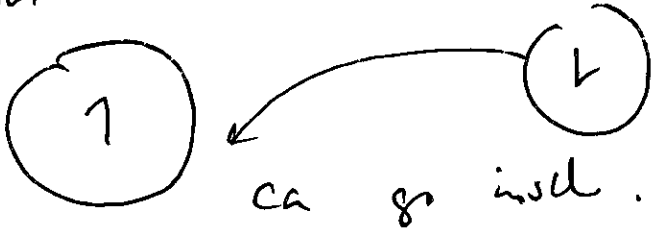
Why are unpaired e^- lower in energy?

It is due to the Pauli exclusion principle



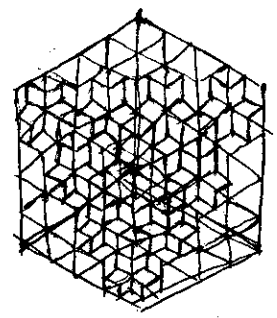
can not get inside close to the other e^- is.

but



can go inside.

$\therefore 1L e^-$ spend more time close to each other.



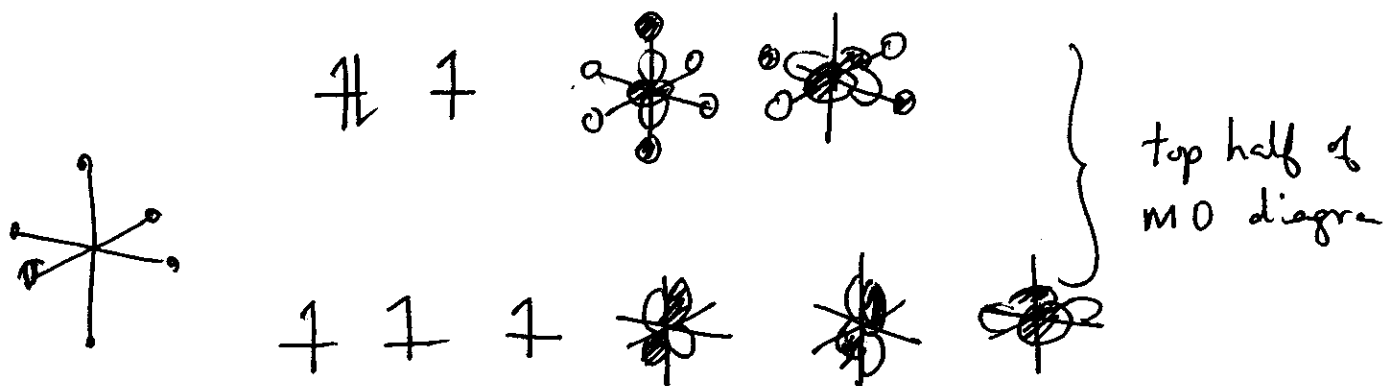
they gain a DeBroglie stabil-

But L

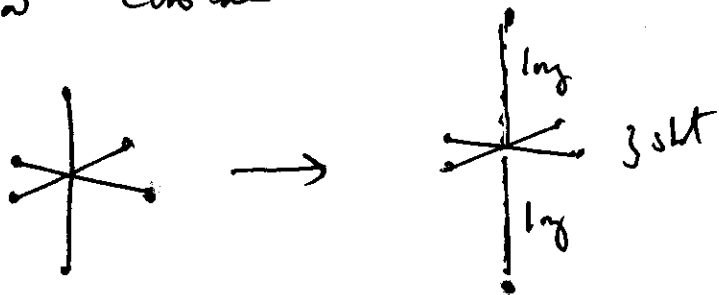
$\uparrow \uparrow$ case vs. $\uparrow\downarrow$ — there is no compensating DeBroglie wave length change & \therefore Hund's rule follows.

Jahn-Teller effect

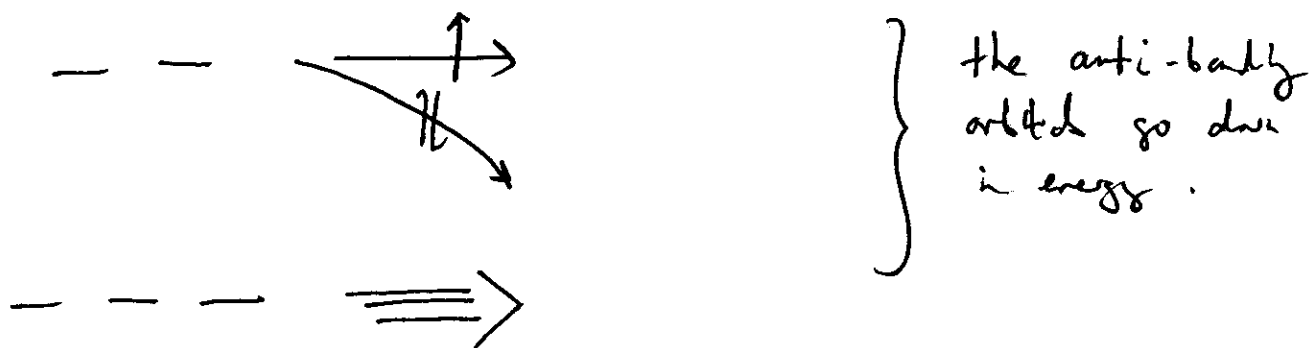
① Consider a ~~high~~ d^9 , octahedral compd.



② Now consider the distortion:

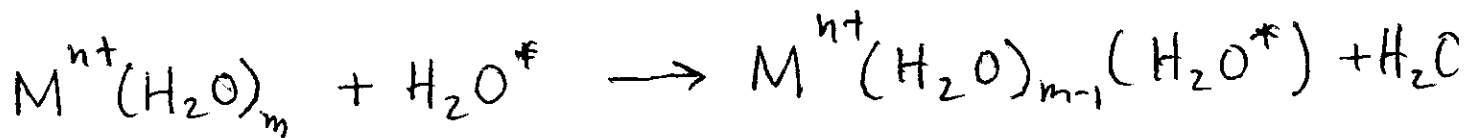


③ MO picture



$\therefore d^9$ octahedral will distort to four short & 2 long bonds. This is called a Jahn-Teller distortion.

Water exchange Rates



m often = 6

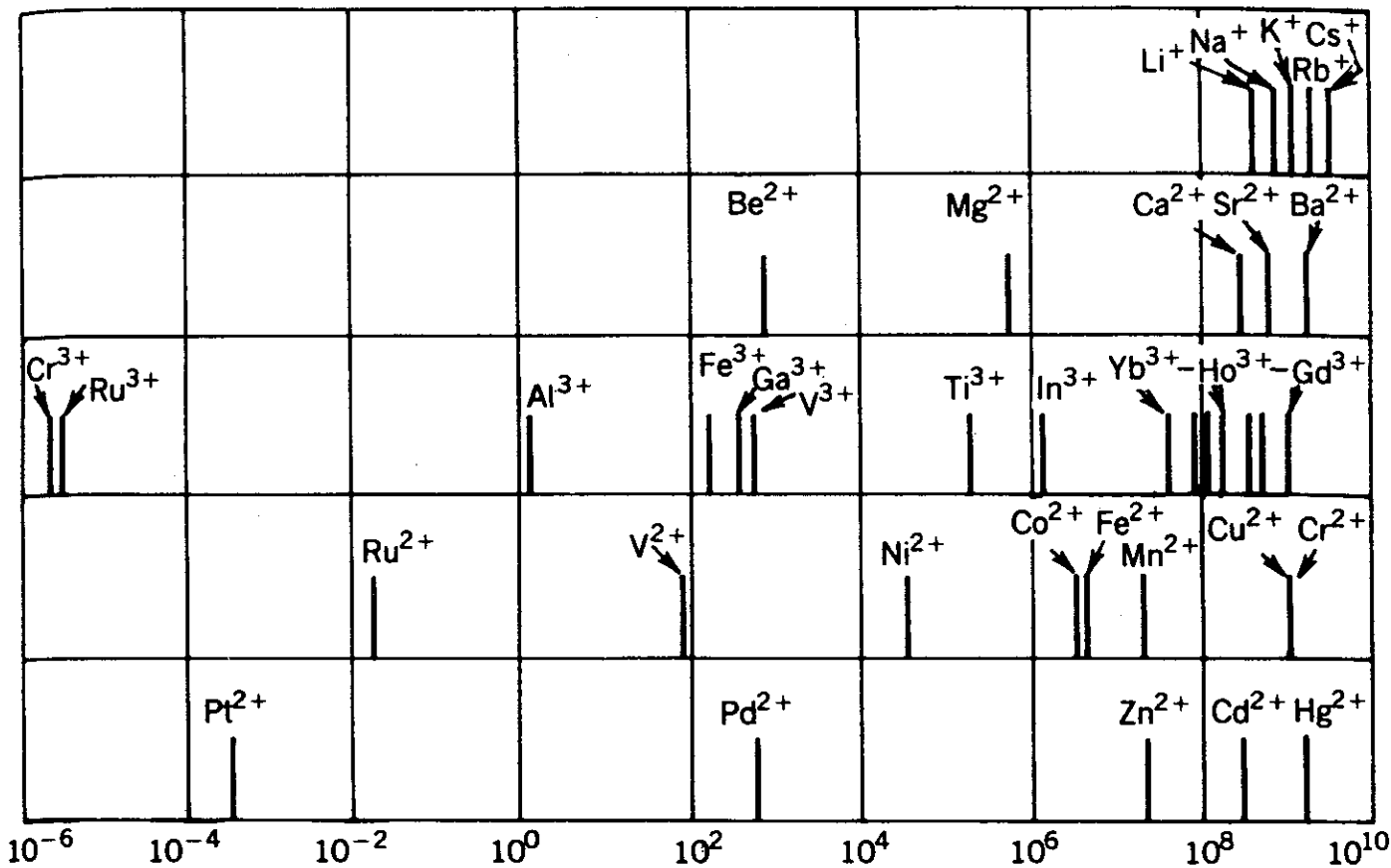


FIG. 29-1. Characteristic rate constants (s⁻¹) for substitution of inner-sphere water molecules on various metal ions (Adapted from M. Eigen, *Pure Appl. Chem.*, 1963, 6, 105 with addition of data from other sources.)

Ir³⁺ & Rh³⁺ are 10⁻¹⁰ slower than the slowest metal ions on this chart.