พันธะเคมี

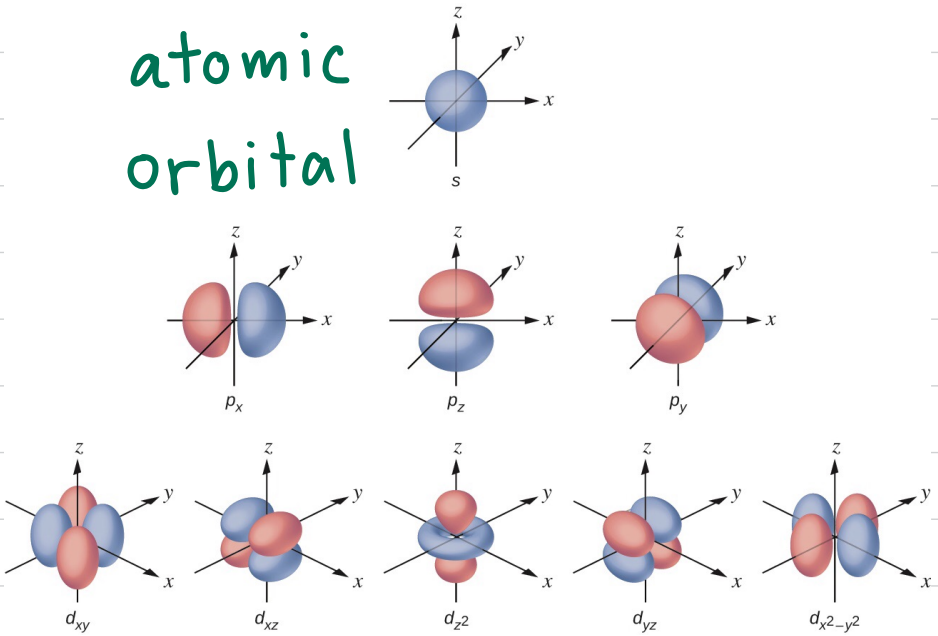
1. Valence Bond
2. Hybridization
3. Molecular Orbital

Valence Bond

atomic orbital มา overlap (ซ้อนทับ / ชนกัน)

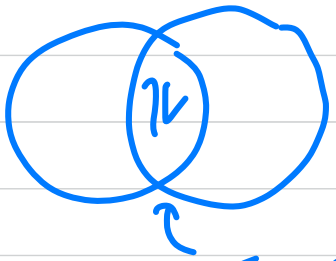
แล้วโอกาสเจอ e^- สูงขึ้น [หัวชนหัว → σ ข้างชนข้าง → π]

atomic orbital



H_2

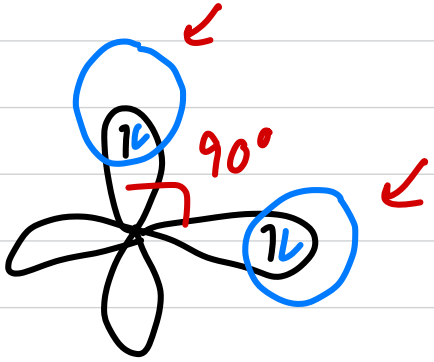
H $\frac{1}{1s}$



$\sigma = 1s(H) + 1s(H)$

CH_4

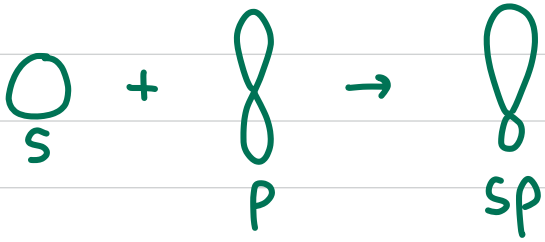
H $\frac{1}{1s}$



C $\frac{1}{2s}$ $\frac{1}{2p}$ $\frac{1}{2p}$ $\frac{}{2p}$

Hybridization

atomic orbital มารวมกันเป็น hybrid orbital (จำนวนช่อง orbital เท่าเดิม)

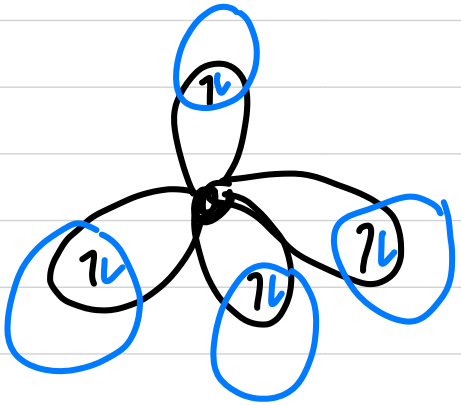


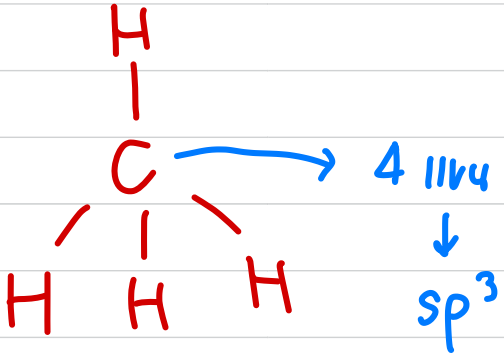
Hybrid Orbitals	Geometric Figure
sp	Linear
sp^2	Trigonal planar
sp^3	Tetrahedral

CH_4

H $\frac{1}{1s}$

C $\frac{1\downarrow}{2s}$ $\frac{1}{2p}$ $\frac{1}{2p}$ $\frac{1}{2p}$ → $\frac{1}{sp^3}$ $\frac{1}{sp^3}$ $\frac{1}{sp^3}$ $\frac{1}{sp^3}$





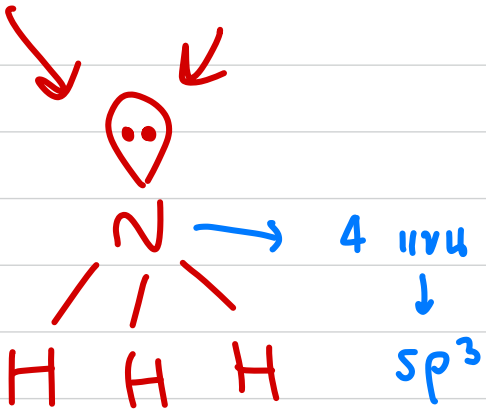
$\sigma = sp^3(C) + 1s(H)$

Hybridization

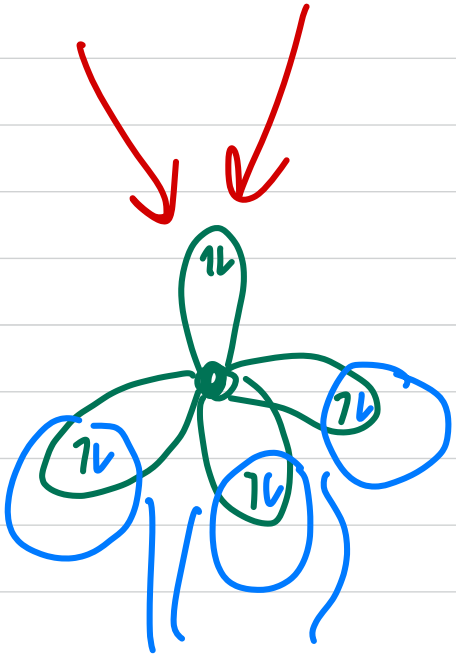
NH_3

H $\frac{1}{1s}$

N $\frac{\uparrow\downarrow}{2s}$ $\frac{\uparrow}{2p}$ $\frac{\uparrow}{2p}$ $\frac{\uparrow}{2p}$ → $\frac{\uparrow\downarrow}{sp^3}$ $\frac{\uparrow}{sp^3}$ $\frac{\uparrow}{sp^3}$ $\frac{\uparrow}{sp^3}$



4 unu → sp^3



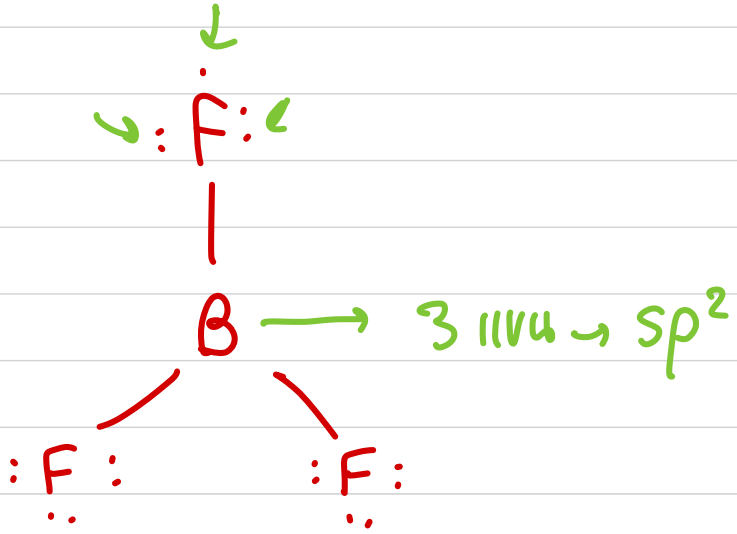
$\sigma = sp^3(N) + 1s(H)$

Hybridization

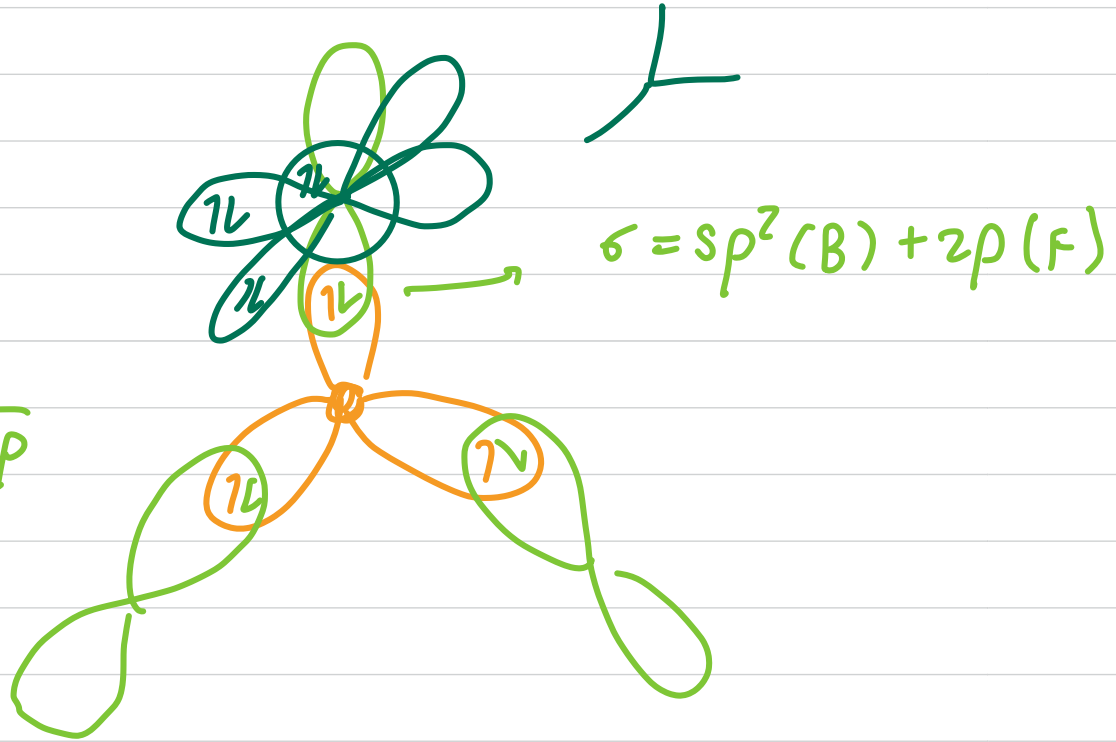
BF_3

F $\underset{2s}{\uparrow\downarrow}$ $\underset{2p}{\uparrow\downarrow}\ \uparrow\ \ \underline{\ \ }$

B $\underset{2s}{\uparrow\downarrow}$ $\underset{2p}{\uparrow}\ \underline{\ \ }\ \underline{\ \ }$ → $\underset{sp^2}{\uparrow}\ \uparrow\ \uparrow$ $\underline{\ \ }$ $2p$



B → 3 hybrid → sp^2



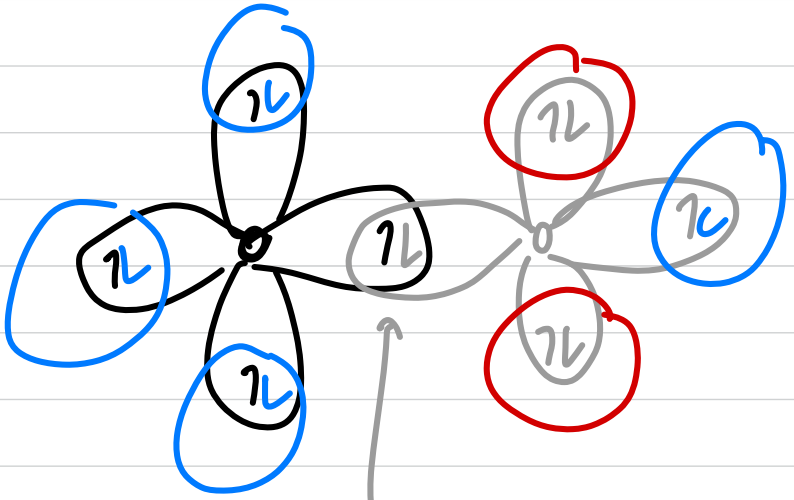
Hybridization

CH_3OH

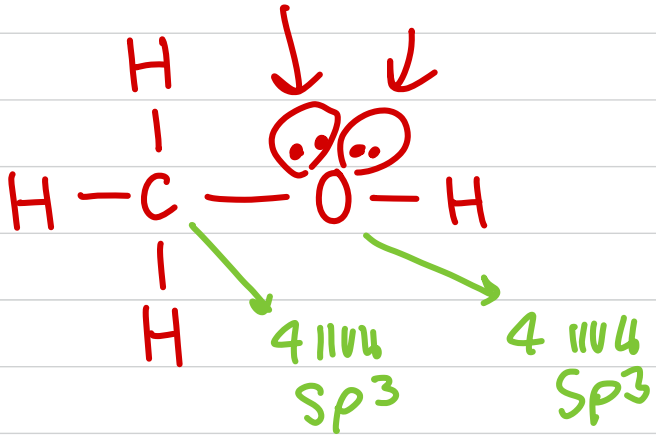
H $\frac{1}{1s}$

C $\frac{\uparrow\downarrow}{2s}$ $\frac{1}{2p}$ $\frac{1}{2p}$ $\frac{}{2p}$ → $\frac{1}{sp^3}$ $\frac{1}{sp^3}$ $\frac{1}{sp^3}$ $\frac{1}{sp^3}$

O $\frac{\uparrow\downarrow}{2s}$ $\frac{\uparrow\downarrow}{2p}$ $\frac{1}{2p}$ $\frac{1}{2p}$ → $\frac{\uparrow\downarrow}{sp^3}$ $\frac{\uparrow\downarrow}{sp^3}$ $\frac{1}{sp^3}$ $\frac{1}{sp^3}$



$\sigma = sp^3(C) + sp^3(O)$

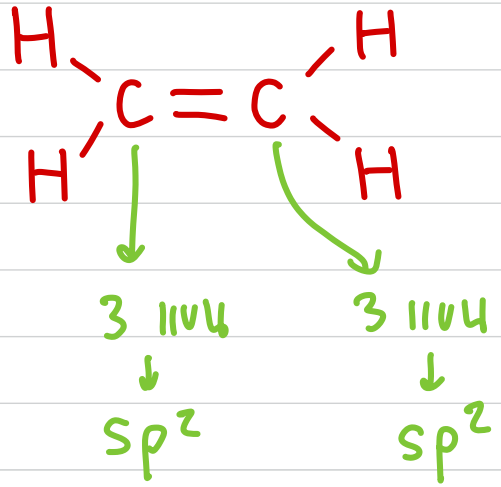


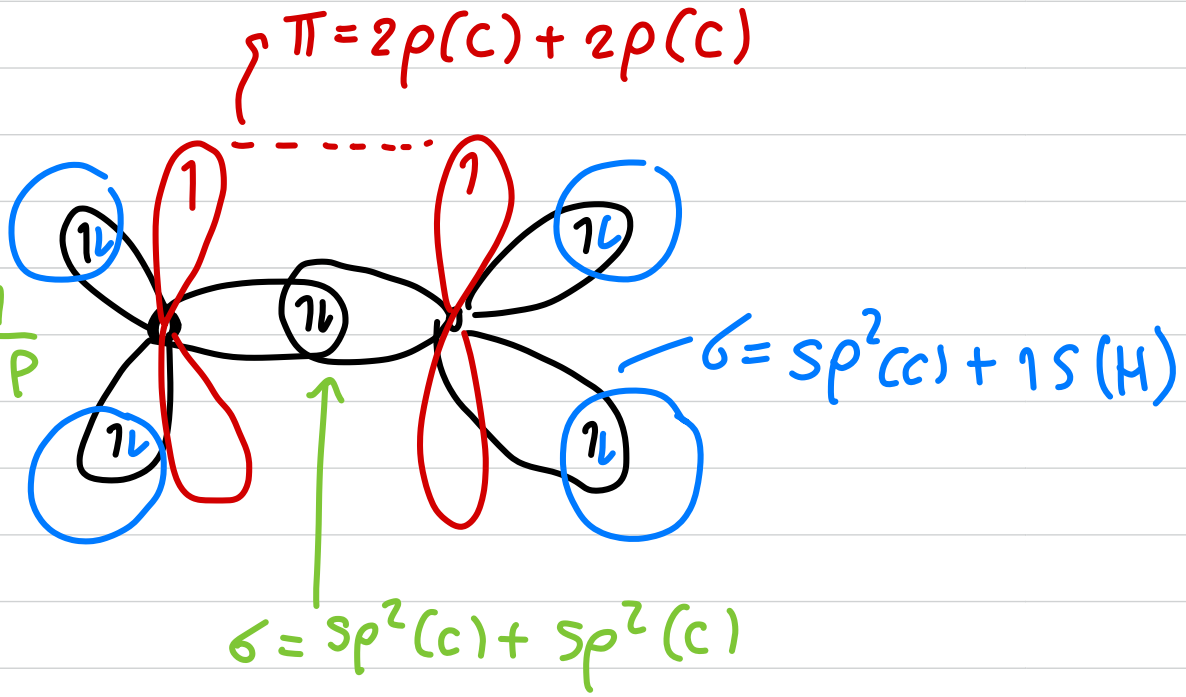
Hybridization

C_2H_4

H $\frac{1}{1s}$

C $\frac{\uparrow\downarrow}{2s}$ $\frac{1}{2p}$ $\frac{1}{2p}$ → $\frac{1}{sp^2}$ $\frac{1}{sp^2}$ $\frac{1}{sp^2}$ $\frac{1}{2p}$





Hybridization

C_2H_2

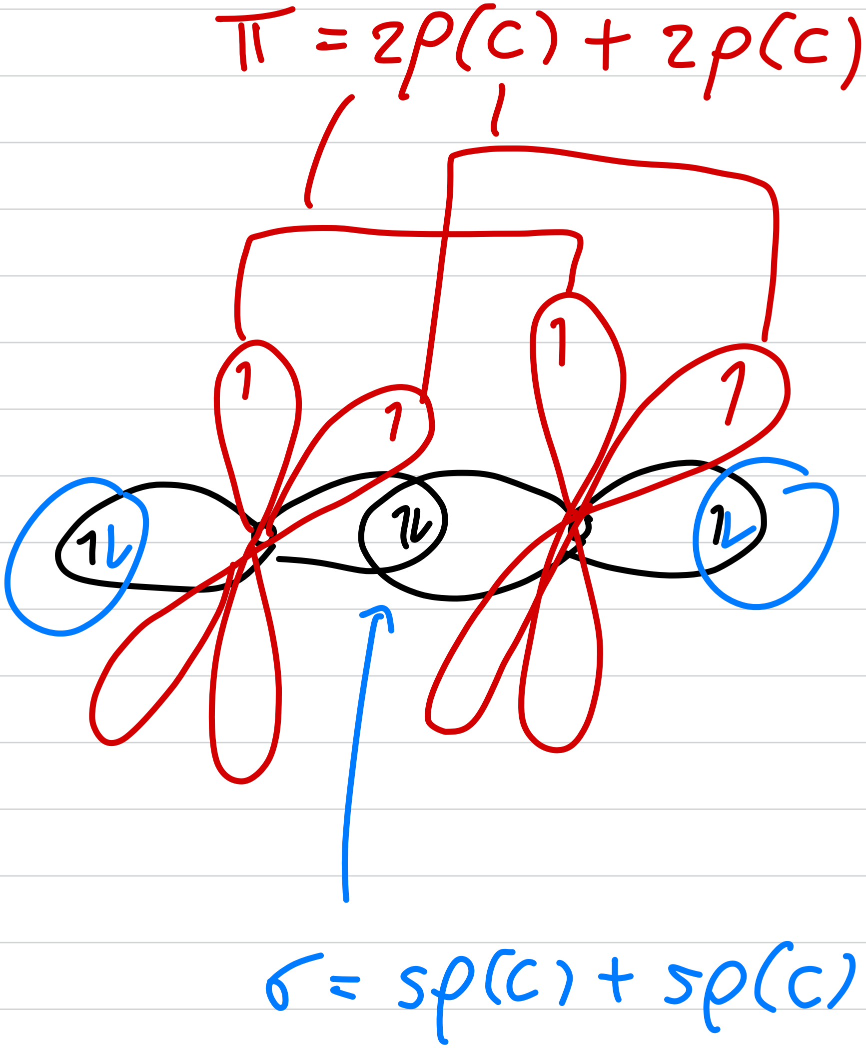
H $\frac{1}{1s}$

C $\frac{\uparrow\downarrow}{2s}$ $\frac{\uparrow}{\ } \frac{\uparrow}{2p} \frac{\ }{\ }$ → $\frac{\uparrow \quad \uparrow}{sp}$ $\frac{\uparrow \quad \uparrow}{2p}$

H − C ≡ C − H

2 ||V4   2 |||V4

sp   sp



Molecular Orbital

atomic orbital รวมกันเป็น bonding, anti-bonding

s → O + O → ⬭ σ_s

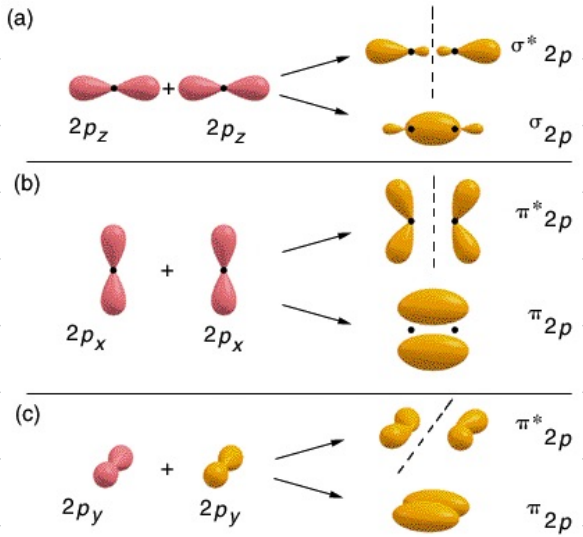
O − O → O ⋮ O σ_s^*

node

} E $\sigma_s < \sigma_s^*$

bond order (MO) = $\frac{\text{จำนวน}^* - {}^*}{2}$

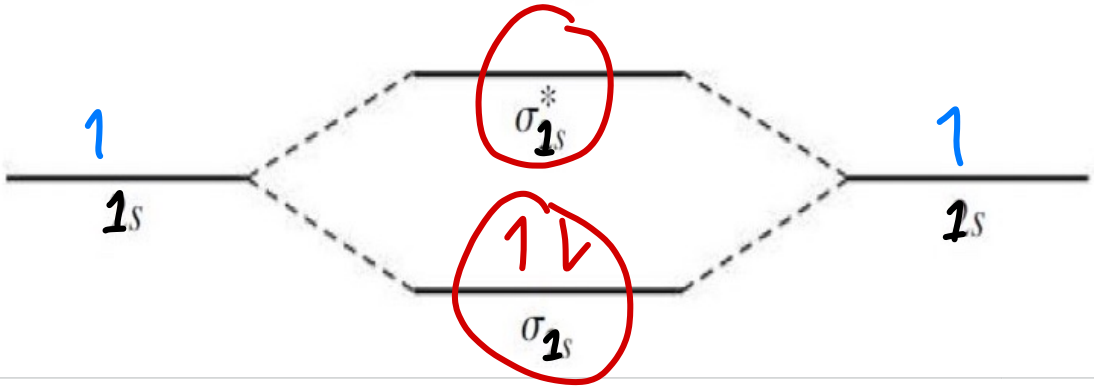
p ↴ E $\sigma_p < \pi_p < \pi_p^* < \sigma_p^*$



H_2

H $\frac{1}{1s}$

$BO = \frac{2-0}{2} = 1$

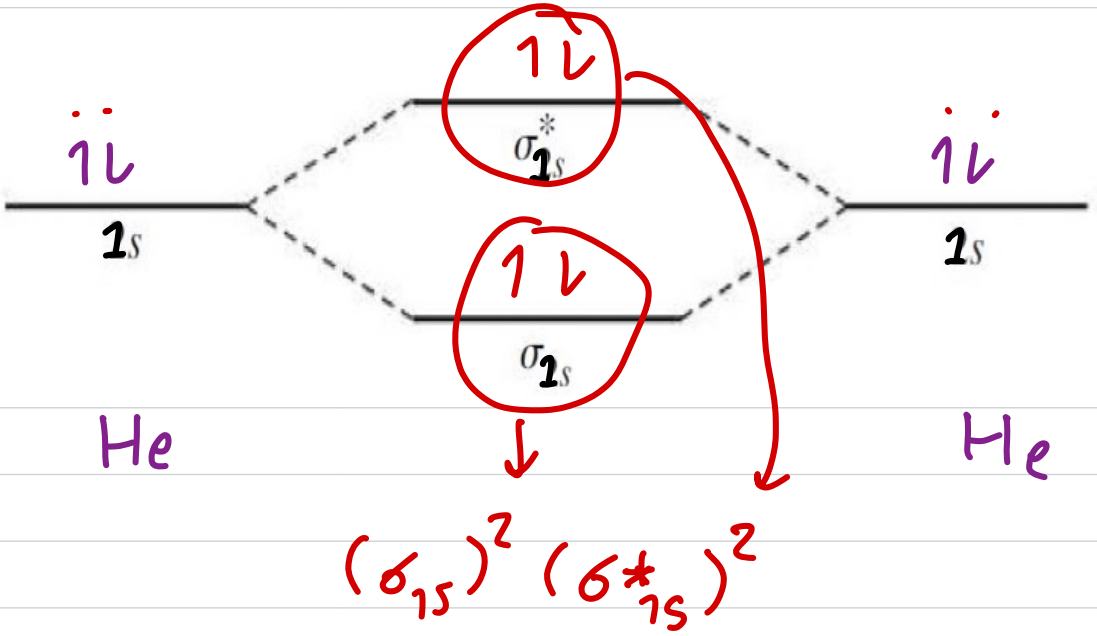


$(\sigma_{1s})^2$

Molecular Orbital

He_2

He $1s$

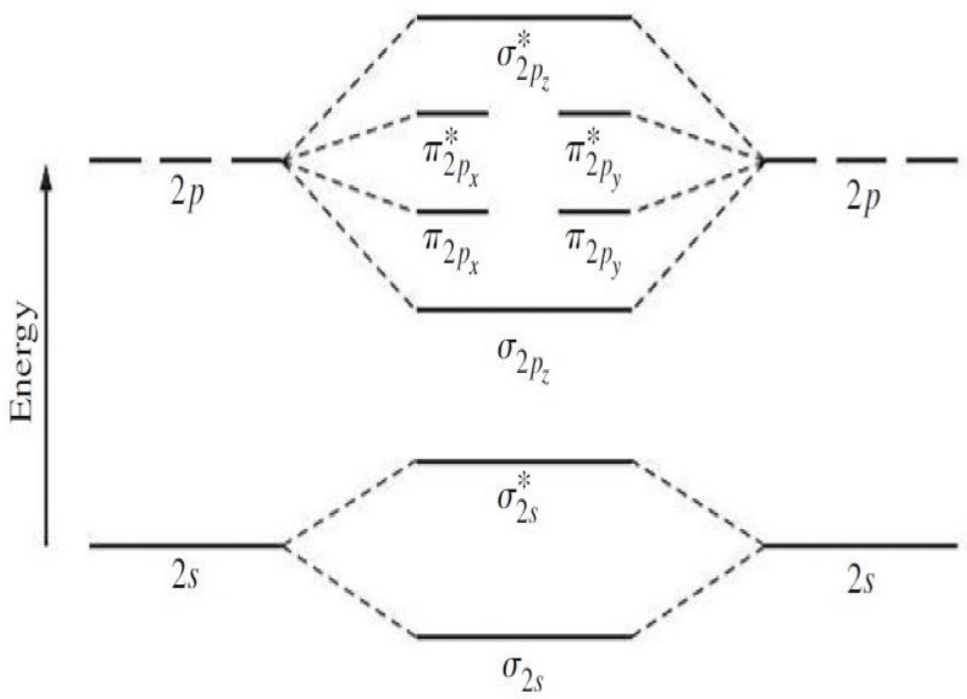


$(\sigma_{1s})^2 (\sigma^*_{1s})^2$

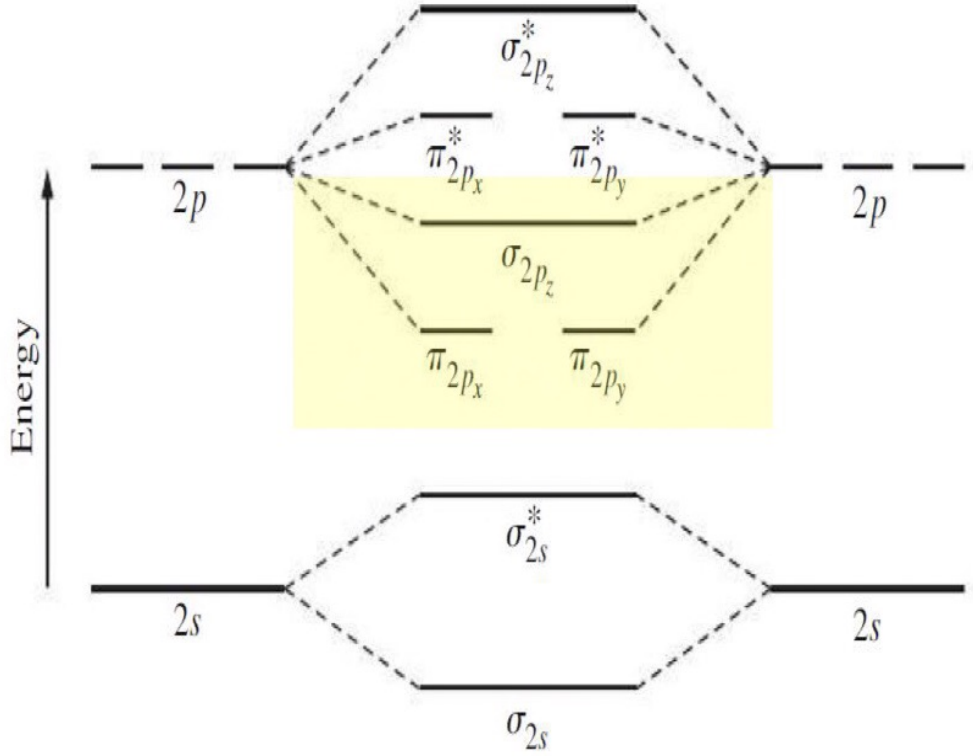
$$BO = \frac{2-2}{2} = 0$$

Molecular Orbital

O_2 , ICl



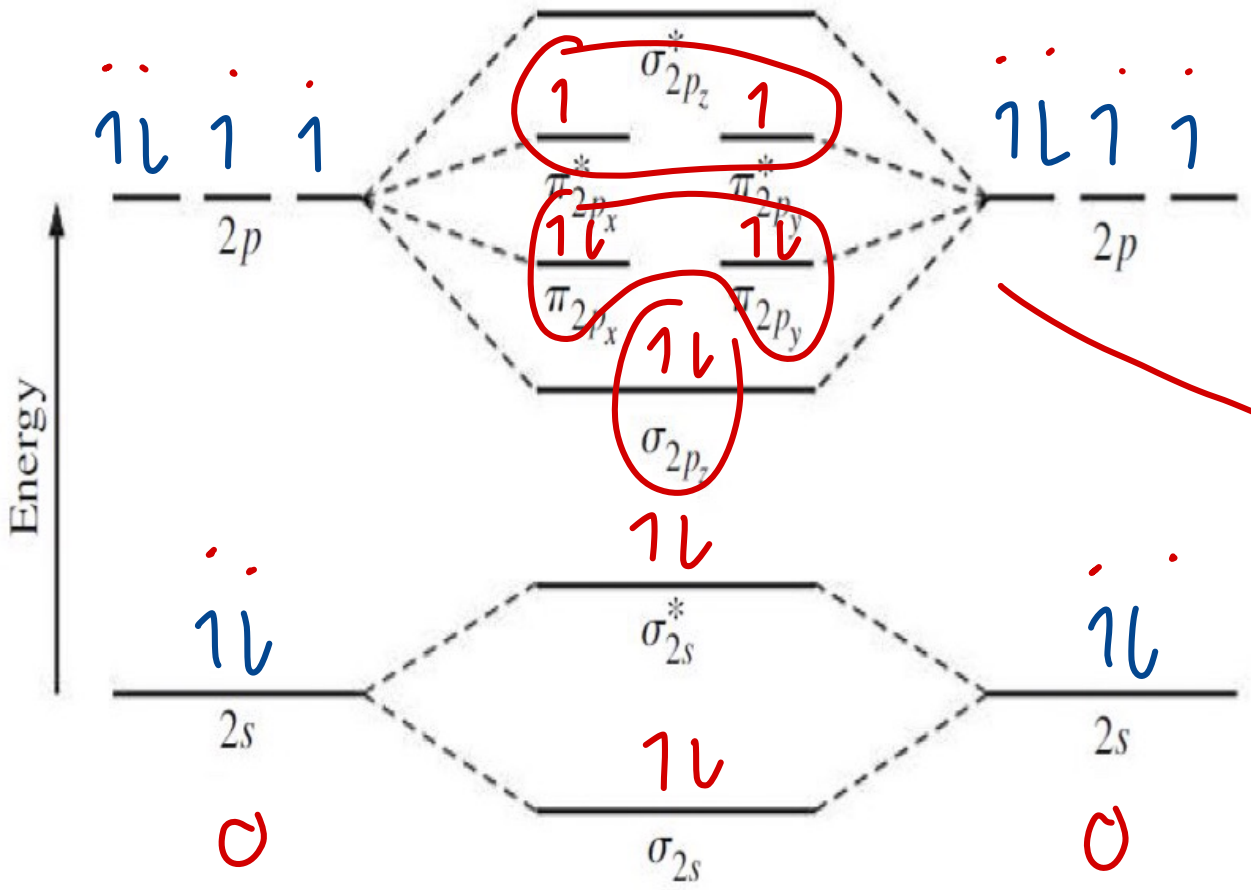
B_2, C_2, N_2 , CN^-, CO, NO



Molecular Orbital

O_2

O $\frac{\uparrow\downarrow}{2s}$ $\frac{\uparrow\downarrow}{2p}$ $\frac{\uparrow}{}$ $\frac{\uparrow}{}$



$BO = \frac{8-4}{2}$

$= 2$

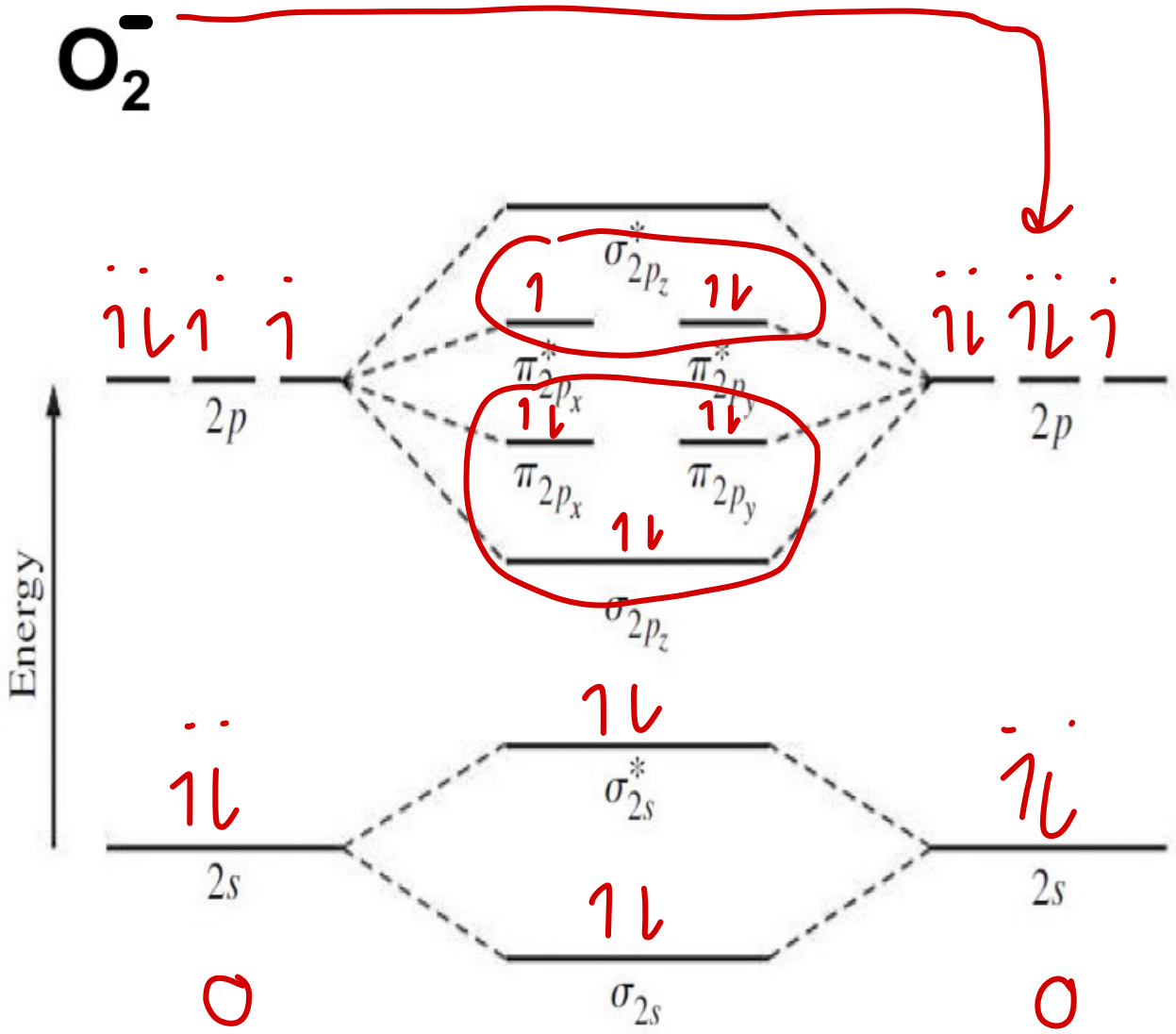
$\frac{6-2}{2} = 2$

O O

$(\sigma_{2s})^2 (\sigma^*_{2s})^2 (\sigma_{2p})^2 (\pi_{2p})^4 (\pi^*_{2p})^2$

Molecular Orbital

O_2^-

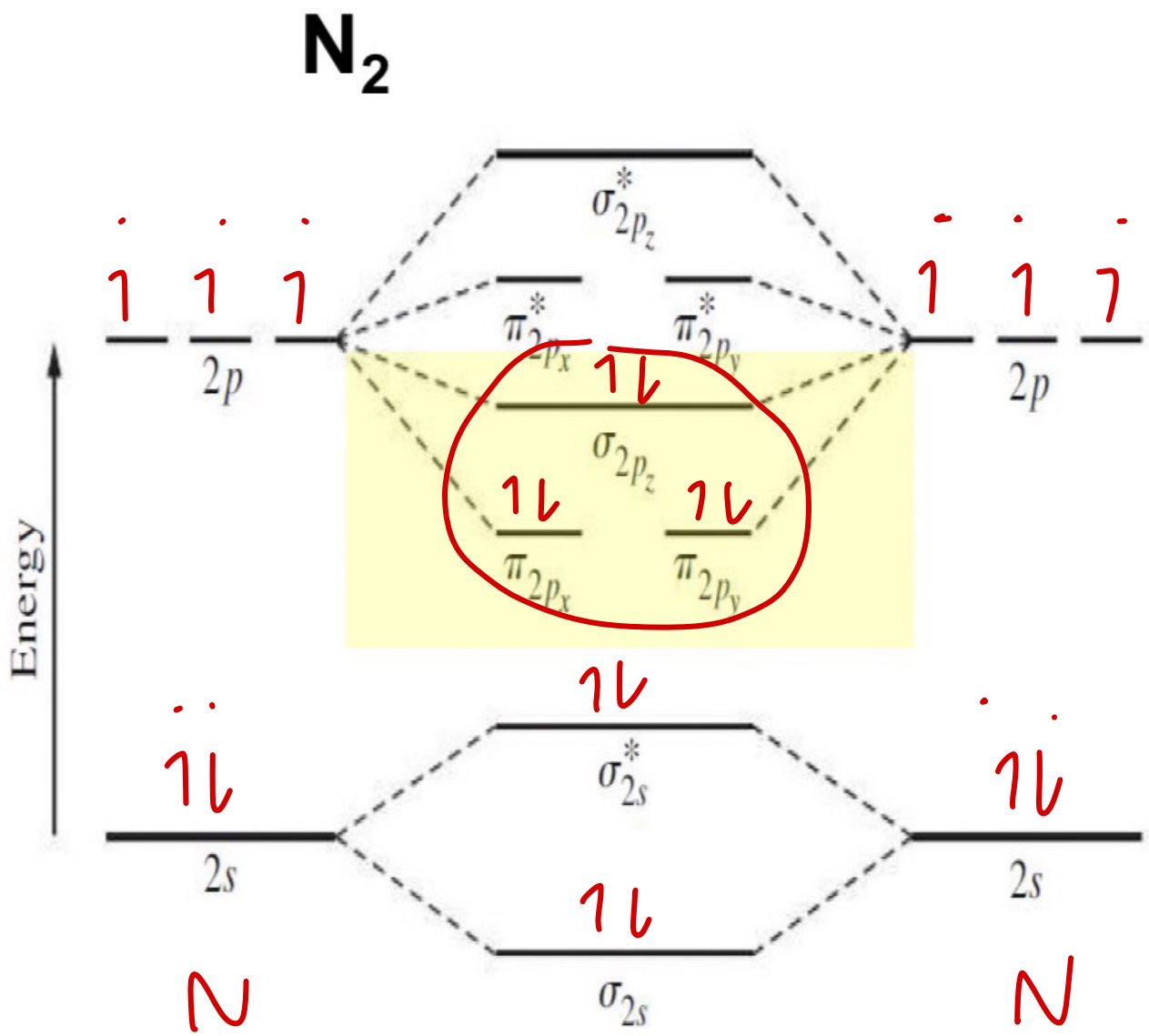


O $\frac{\uparrow\downarrow}{2s}$ $\frac{\uparrow\downarrow}{2p}$ $\frac{\uparrow}{2p}$ $\frac{\uparrow}{2p}$

$$BO = \frac{6-3}{2} = 1.5$$

$$(\sigma_{2s})^2 (\sigma^*_{2s})^2 (\sigma_{2p})^2 (\pi_{2p})^4 (\pi^*_{2p})^3$$

Molecular Orbital



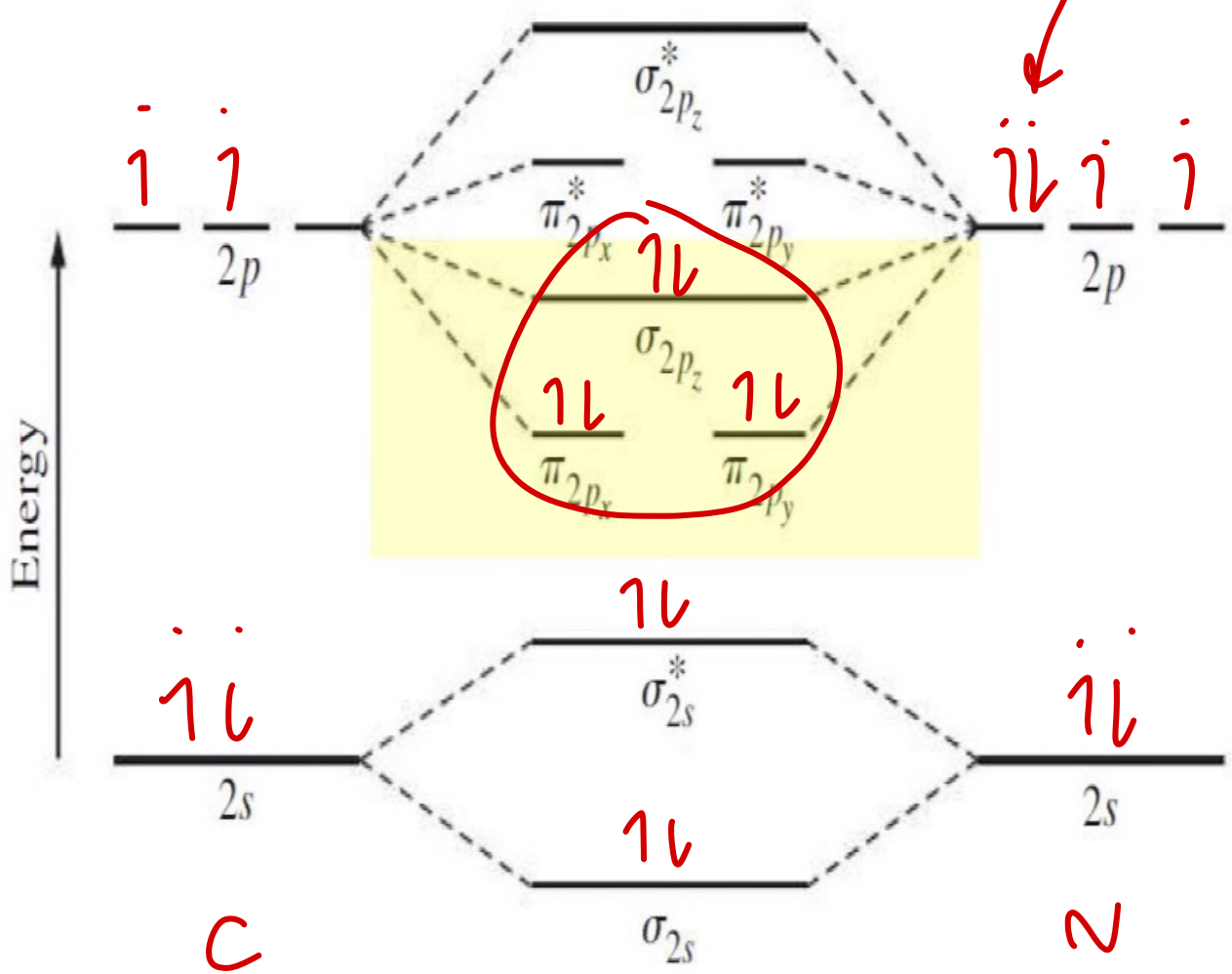
$(\sigma_{2s})^2(\sigma^*_{2s})^2(\pi_{2p})^4(\sigma_{2p})^2$

N $\frac{\uparrow\downarrow}{2s}$ $\frac{1}{2p}$ $\frac{1}{2p}$ $\frac{1}{2p}$

$BO = \frac{6-0}{2} = 3$

Molecular Orbital

CN^-



C $\frac{\uparrow\downarrow}{2s}$ $\frac{\uparrow}{2p}$ $\frac{\uparrow}{2p}$ $\frac{}{2p}$

N $\frac{\uparrow\downarrow}{2s}$ $\frac{\uparrow}{2p}$ $\frac{\uparrow}{2p}$ $\frac{\uparrow}{2p}$

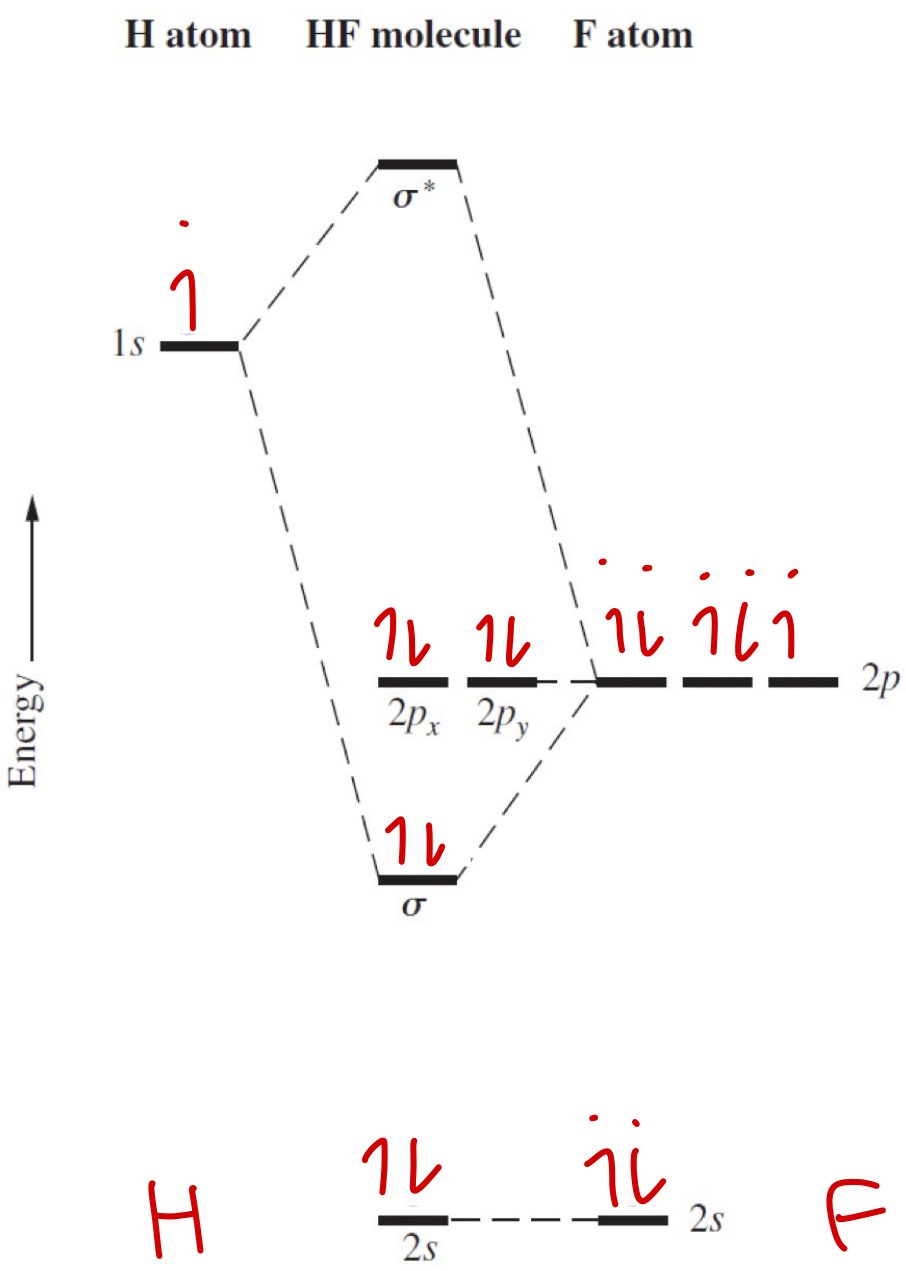
$$BO = \frac{6-0}{2} = 3$$

Molecular Orbital

HF

H $\frac{1}{1s}$

F $\frac{1\downarrow}{2s}$ $\frac{1\downarrow\ 1\downarrow\ 1}{2p}$



Khem Nithit

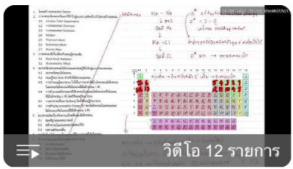
@khemnithit5847 ผู้ติดตาม 236 คน วิดีโอ 114 รายการ

ข้อมูลเพิ่มเติมเกี่ยวกับช่องนี้ >

ติดตาม

หน้าแรก | วิดีโอ | สด | เพลย์ลิสต์ | ชุมชน | ช่อง | เกี่ยวกับ

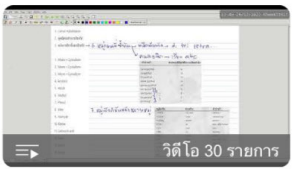
---- COMPLETED ----



GENERAL CHEMISTRY

Khem Nithit · เพลย์ลิสต์

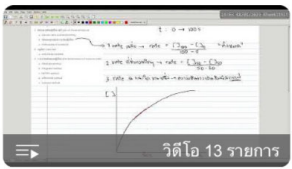
ดูทั้งเพลย์ลิสต์



ORGANIC CHEMISTRY 1/2

Khem Nithit · เพลย์ลิสต์

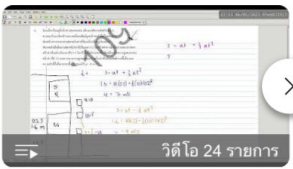
ดูทั้งเพลย์ลิสต์



PHYSICAL CHEMISTRY 1/2

Khem Nithit · เพลย์ลิสต์

ดูทั้งเพลย์ลิสต์

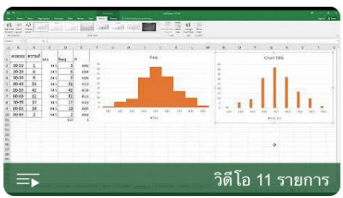


GENERAL PHYSICS 1/2

Khem Nithit · เพลย์ลิสต์

ดูทั้งเพลย์ลิสต์

---- ACTIVE ----



STATISTICS

Khem Nithit • อัปเดตเมื่อ 3 วันที่แล้ว

Stat Lab 1 • 20:05

Stat 2 (1/2) • 32:41

ดูทั้งเพลย์ลิสต์