

- I PARZIALE Sabato 12 Aprile 2025 ore 9.00 Aule P1+P2+P3
- II PARZIALE Martedì 17 Giugno 2025 ore 9.00 Aule P300 P1+P2+P3
- I APPELLO
- ORALE Martedì 24 Giugno 2025 ore 9.00 OB
- II APPELLO Lunedì 7 Luglio 2025 ore 9.00 P1+P2
- ORALE Lunedì 14 Luglio 2025 ore 9.00 P300
- III APPELLO SOLO ORALE Martedì 16 Settembre 2025 ore 9.00 P300
- IV APPELLO SOLO ORALE Febbraio 2026

DOCENTE

monica.dettin@unipd.it

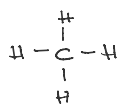
049-8275553

Studio: via Marzolo, 9

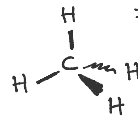
Di fianco al bar  
Sotto l'arco a dx

TEORIA DELL'IBRIDAZIONE

Formula bruta  
 $CH_4$

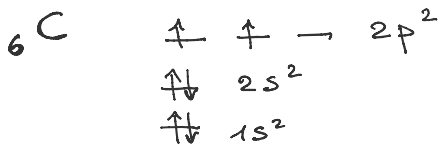
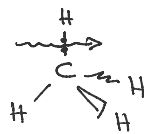
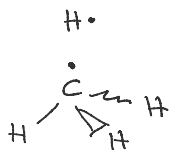


Formula prospettica



Metano

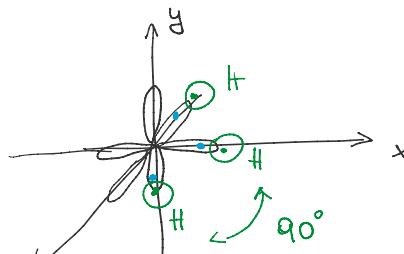
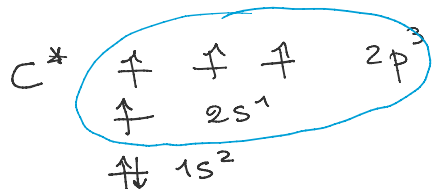
4 legami C-H  
equivalenti:  
 $l = 1,1 \text{ \AA} \text{ (} 1 \text{ \AA} = 10^{-10} \text{ m)}$   
 $F = 104 \text{ Kcal/mole}$   
 $\alpha = 109,5^\circ$

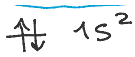


Bivalente?  
No Tetraivalente!

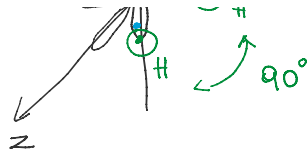
:CH<sub>2</sub> Metilene (carbene)

Fornisco energie al C e passo al suo stato eccitato (96 Kcal/mole)





IBRIDAZIONE di tipo  $sp^3$



4 orbitali ibridi di tipo  $sp^3$

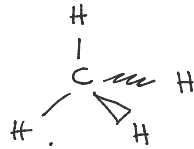
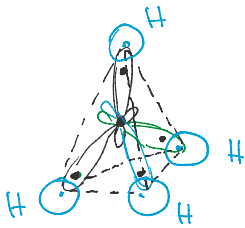
$$\Psi_{sp^3} = C_1 \Psi_{2s} + C_2 \Psi_{2p_x} + C_3 \Psi_{2p_y} + C_4 \Psi_{2p_z}$$



$sp^3$

$\frac{1}{4}$  CARATTERE S  
 $\frac{3}{4}$  CARATTERE P

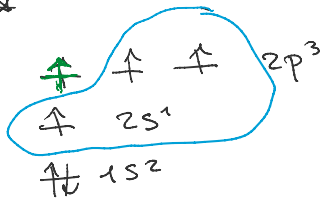
Maggiore il carattere s  
 Maggiore il carattere p  
 più corto il lobo maggiore



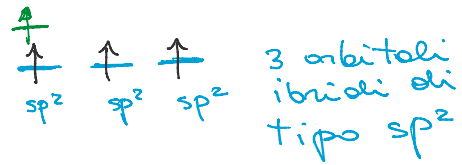
IBRIDAZIONE  $sp^{2+}$

$sp^3$  previsto per il "mescolamento" un orbitale s (2s) e 3 orbitali p (2p)

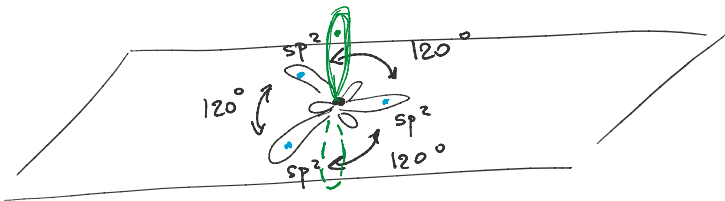
$C^*$



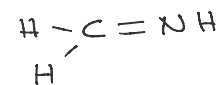
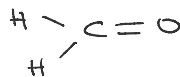
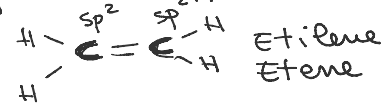
IBRIDAZIONE  $sp^2$



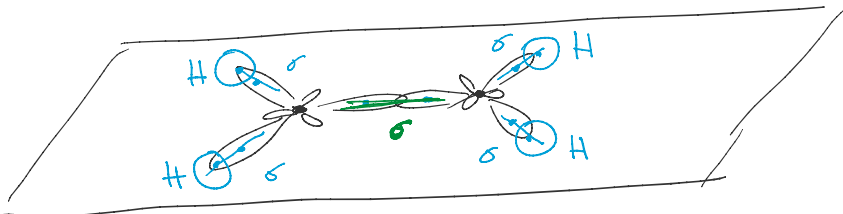
$\frac{1}{3}$  CARATTERE S  
 $\frac{2}{3}$  CARATTERE P



Il C è ibridizzato  $sp^2$  quando forma legami doppi

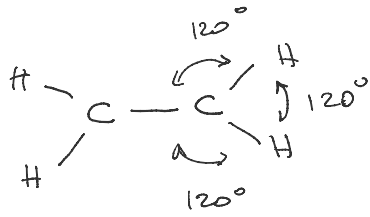


legame  $\sigma$  ha la max densità elettronica lungo la congiungente i nuclei

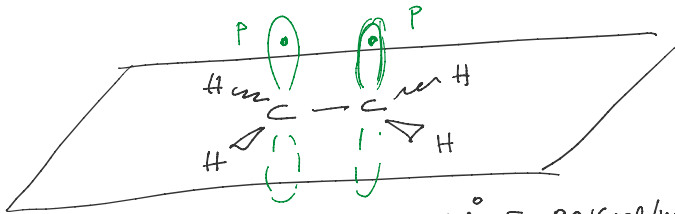


#5

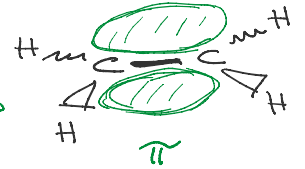
i nuclei



Molecole PLANARE

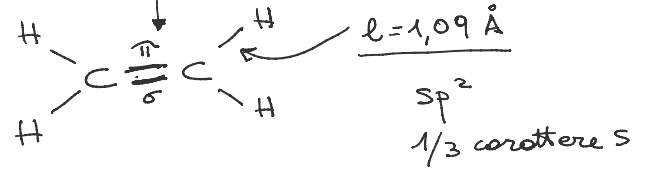
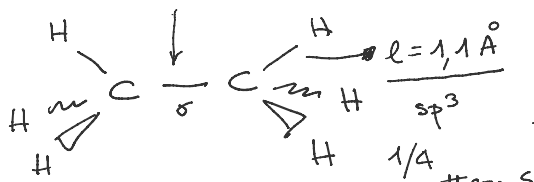


Sovrapposizione lato-lato dei 2 orbitali p



$l = 1,54 \text{ \AA}$   $F = 90 \text{ Kcal/mole}$

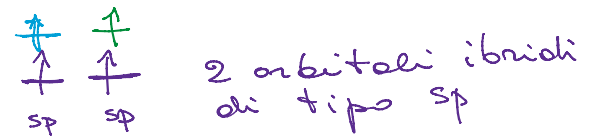
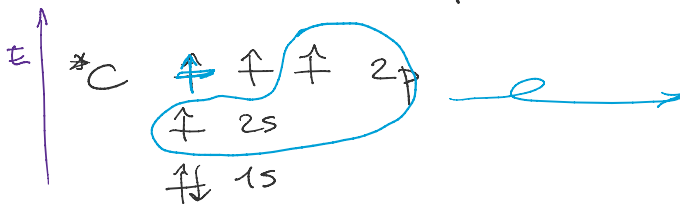
$l = 1,34 \text{ \AA}$   $F = 173 \text{ Kcal/mole}$



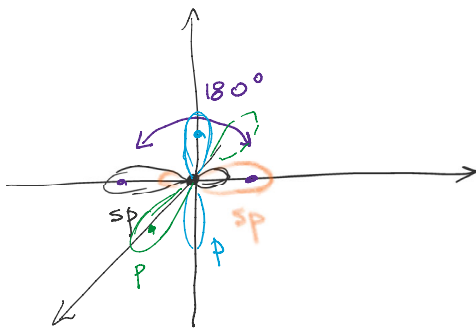
Etano

Etilene

IBRIDAZIONE SP

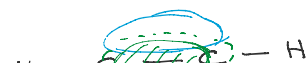
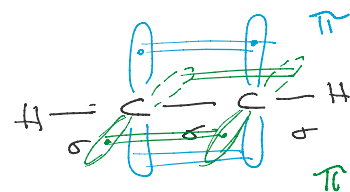
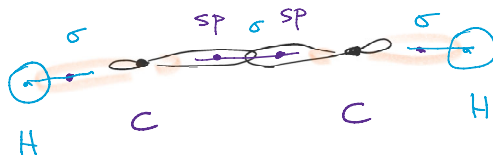
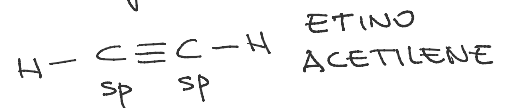


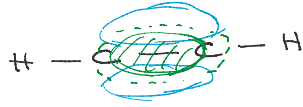
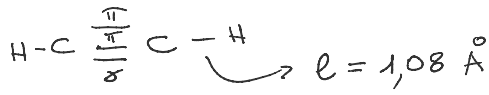
$\infty$  1/2 carattere s  
1/2 carattere p



$\Rightarrow$  Molecole Lineari

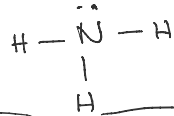
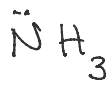
Il C è sp quando forma legami tripli



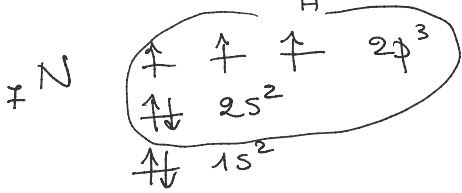


$F = 200 \text{ kcal/mole}$   
 $\ell = 1,2 \text{ \AA}$

Ibridazione  $sp^3$  in atomi diversi dal C



$\alpha = 107^\circ$  Angolo di legame effettivo



$\rightarrow$  Angoli di legame  $90^\circ$

Ibridazione  $sp^3$

