



O_h ($m\bar{3}m$)	E	$8C_3$	$6C_2$	$6C_4$	$3C_2$ ($= C_4^2$)	i	$6S_4$	$8S_6$	$3\sigma_h$	$6\sigma_d$	
A _{1g}	1	1	1	1	1	1	1	1	1	1	$x^2 + y^2 + z^2$
A _{2g}	1	1	-1	-1	1	1	-1	1	1	-1	
E _g	2	-1	0	0	2	2	0	-1	2	0	$(2z^2 - x^2 - y^2,$ $\sqrt{3}(x^2 - y^2))$
T _{1g}	3	0	-1	1	-1	3	1	0	-1	-1	(R_x, R_y, R_z)
T _{2g}	3	0	1	-1	-1	3	-1	0	-1	1	(xy, xz, yz)
A _{1u}	1	1	1	1	1	-1	-1	-1	-1	-1	
A _{2u}	1	1	-1	-1	1	-1	1	-1	-1	1	
E _u	2	-1	0	0	2	-2	0	1	-2	0	
T _{1u}	3	0	-1	1	-1	-3	-1	0	1	1	(x, y, z)
T _{2u}	3	0	1	-1	-1	-3	1	0	1	-1	

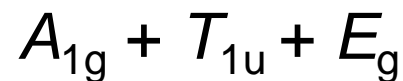
Molecole ipervalenti: SF₆ (gruppo O_h)

O _h	E	8C ₃	6C ₂	6C ₄	3C ₂ (= C ₄ ²)	i	6S ₄	8S ₆	3σ _h	6σ _d
A _{1g}	1	1	1	1	1	1	1	1	1	1
A _{2g}	1	1	-1	-1	1	1	-1	1	1	-1
E _g	2	-1	0	0	2	2	0	-1	2	0
T _{1g}	3	0	-1	1	-1	3	1	0	-1	-1
T _{2g}	3	0	1	-1	-1	3	-1	0	-1	1
A _{1u}	1	1	1	1	1	-1	-1	-1	-1	-1
A _{2u}	1	1	-1	-1	1	-1	1	-1	-1	1
E _u	2	-1	0	0	2	-2	0	1	-2	0
T _{1u}	3	0	-1	1	-1	-3	-1	0	1	1
T _{2u}	3	0	1	-1	-1	-3	1	0	1	-1

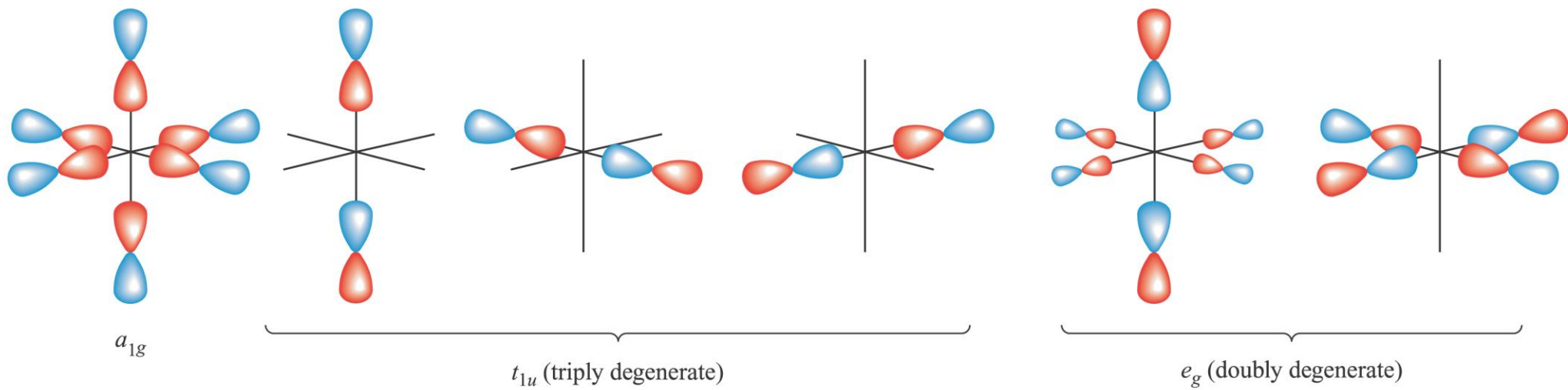
sei 2p_z radiali =

sei lone pairs delle molecole di NH₃

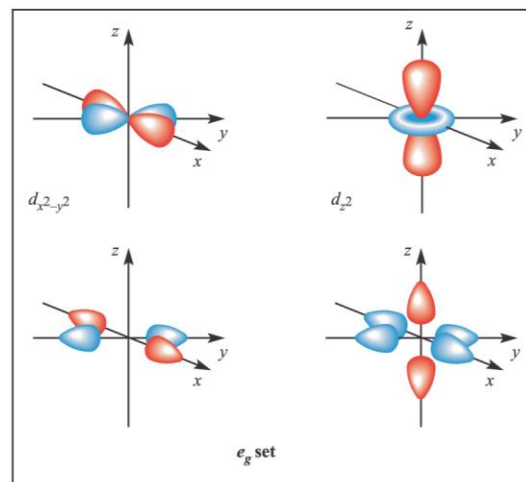
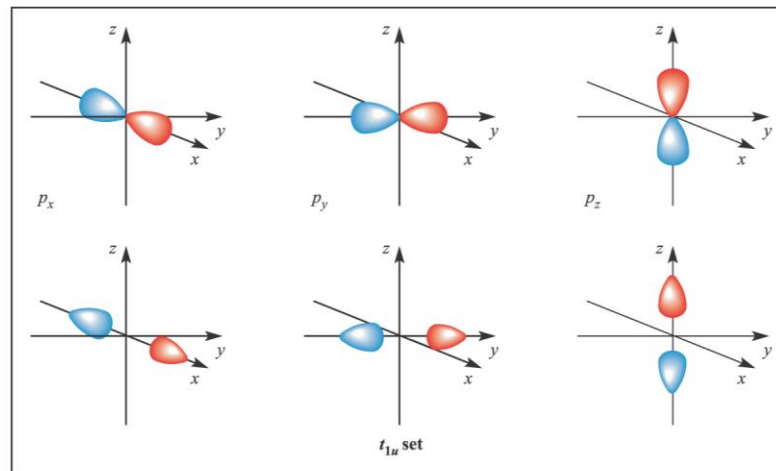
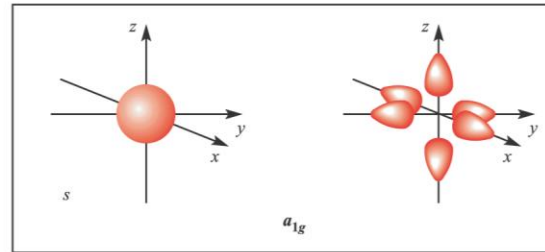
E	8C ₃	6C ₂	6C ₄	3C ₂	i	6S ₄	8S ₆	3σ _h	6σ _d
6	0	0	2	2	0	0	0	4	2

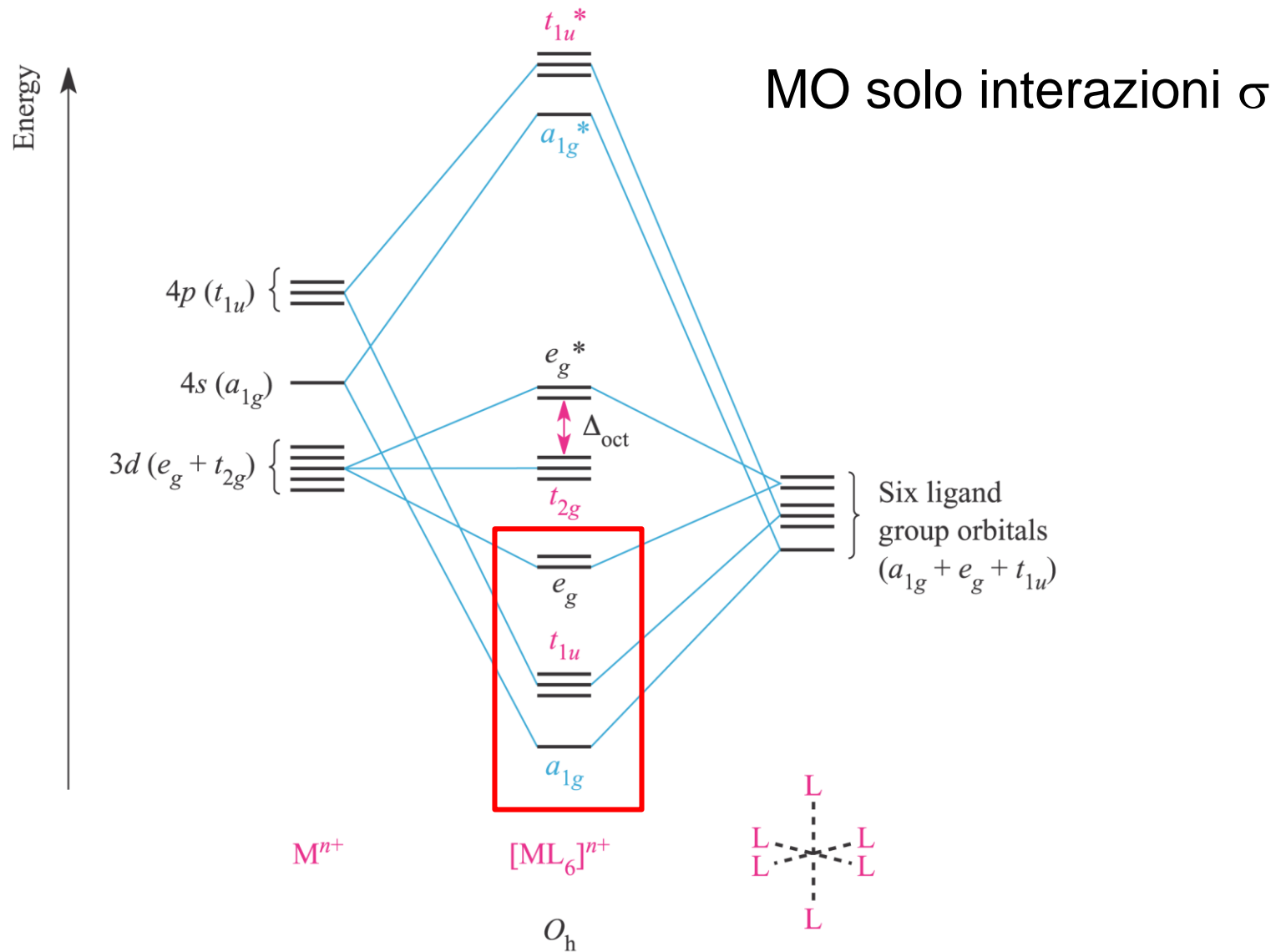


LGO del gruppo F_6 in SF_6



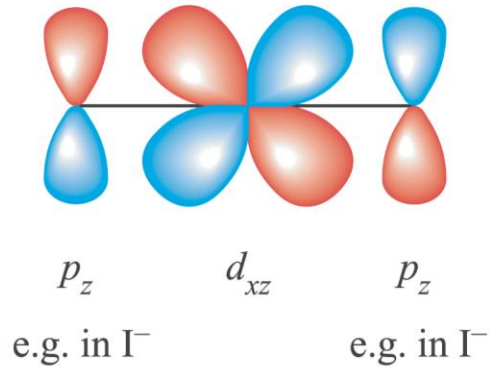
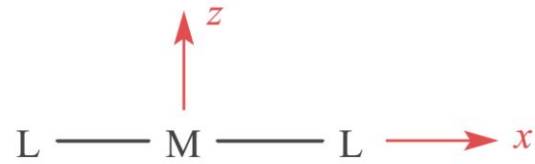
LGO di $[\text{Co}(\text{NH}_3)_6]^{3+}$





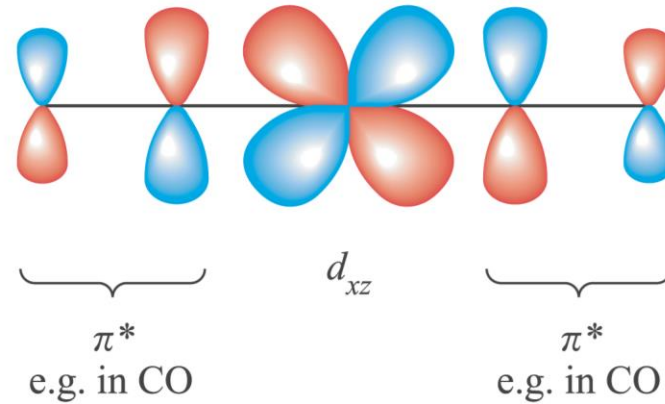
La sovrapposizione tra gli LGO e gli orbitali s e p del metallo è maggiore di quella con gli orbitali d, e quindi gli MO a_{1g} e t_{1u} saranno stabilizzati più degli e_g .

Interazioni π



(a)

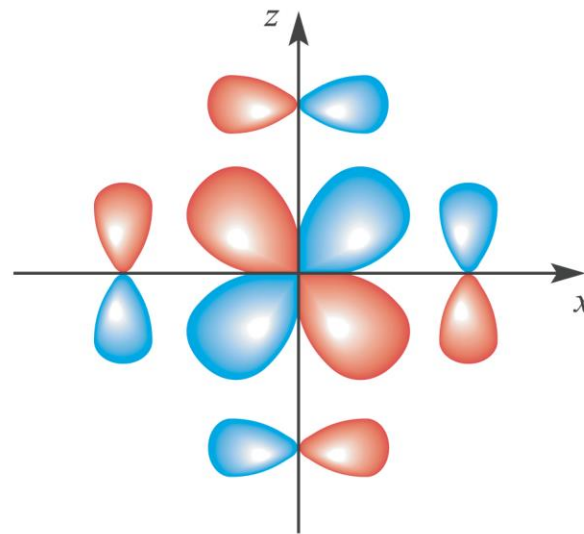
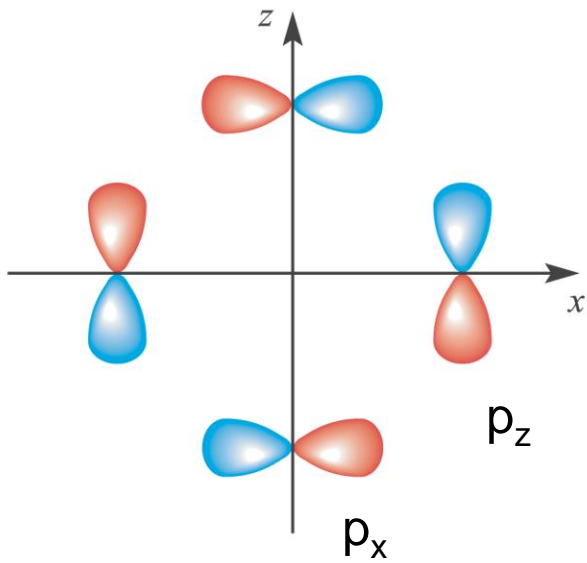
π -donatore



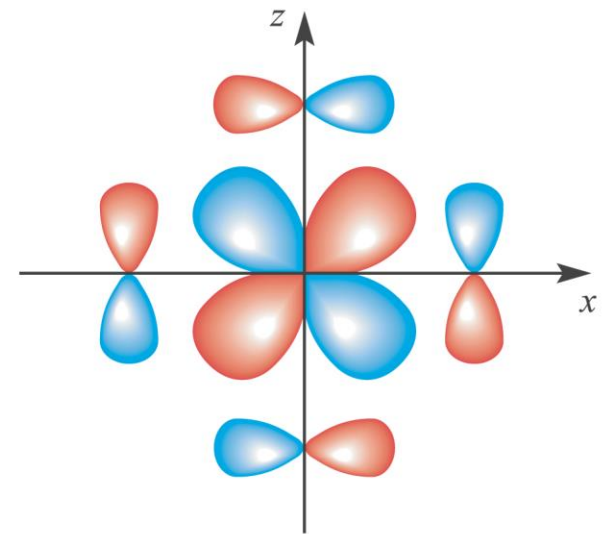
(b)

π -accettore
(retrodonazione π)

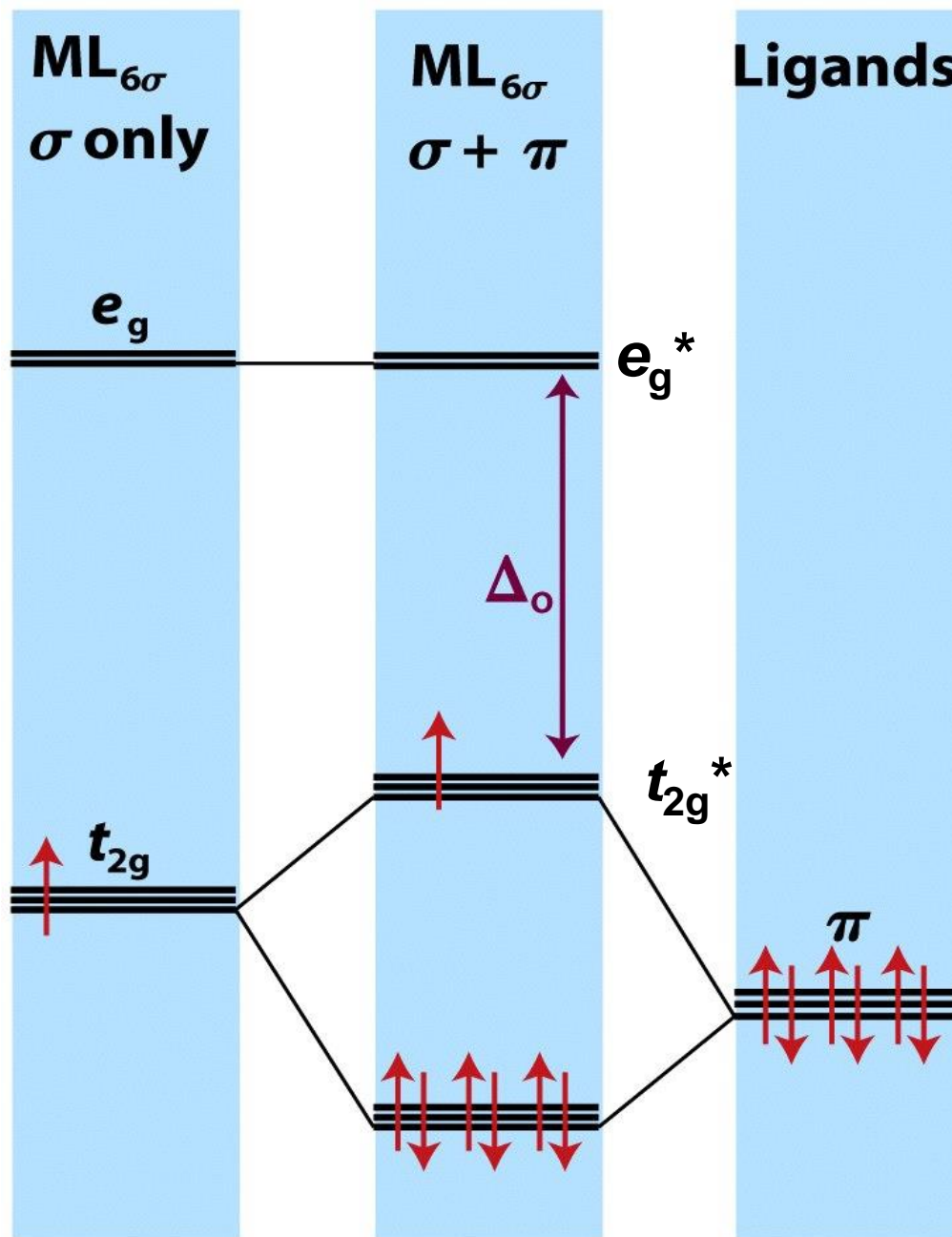
LGO π in un piano di un ottaedro



combinazione legante

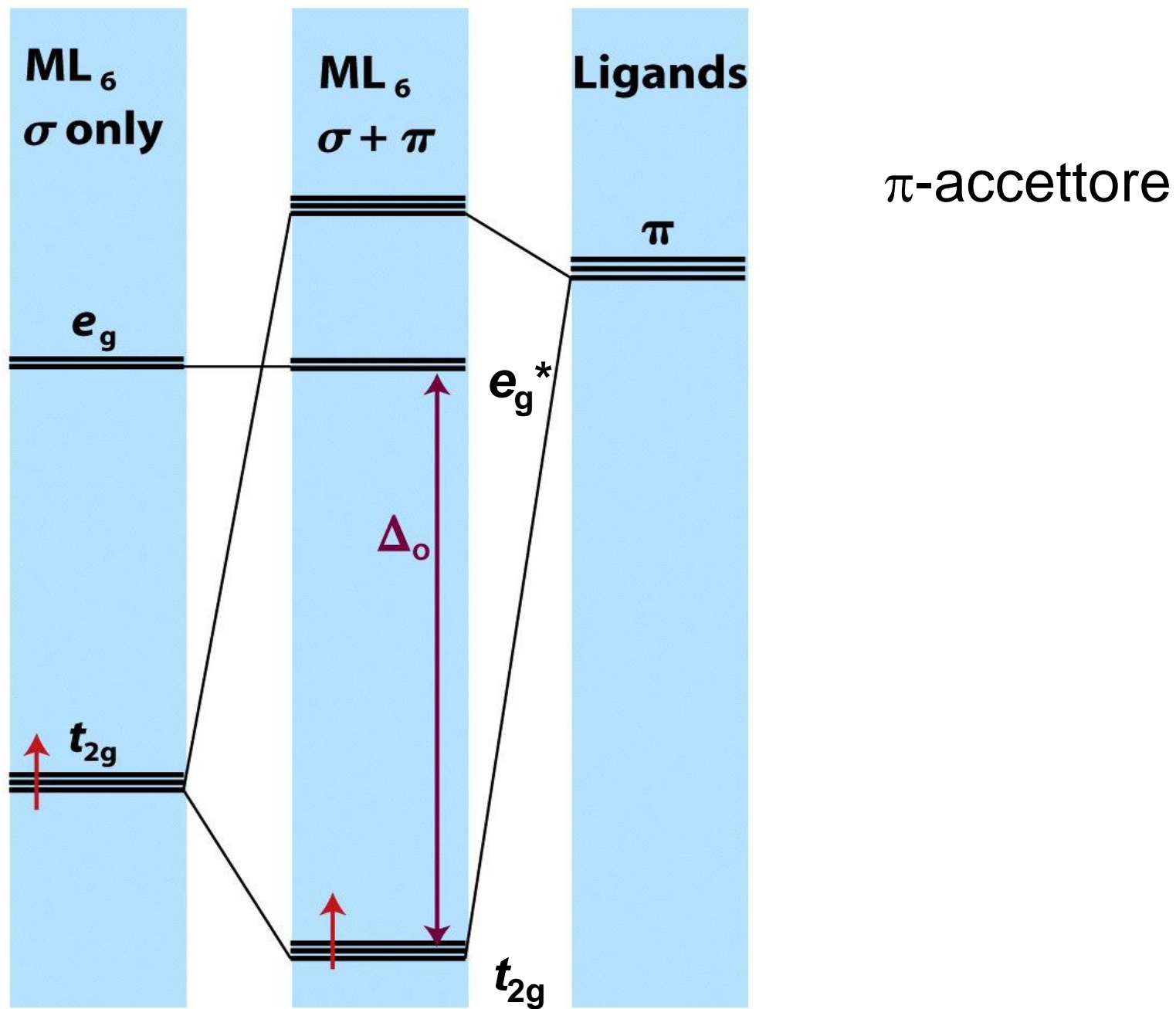


combinazione antilegante

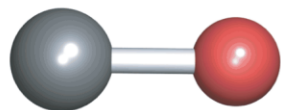
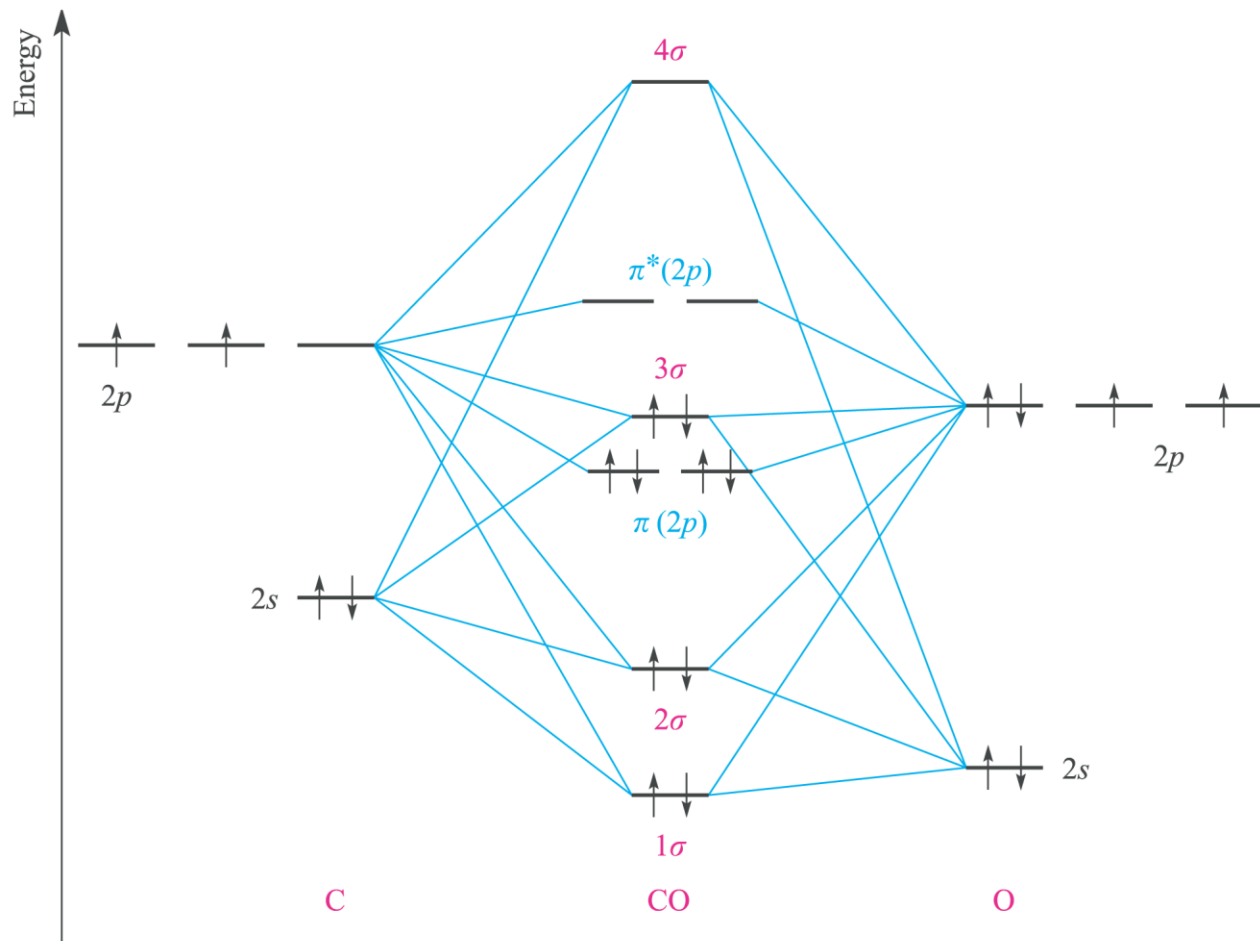


π -donatore
e.g. $[\text{CoF}_6]^{3-}$

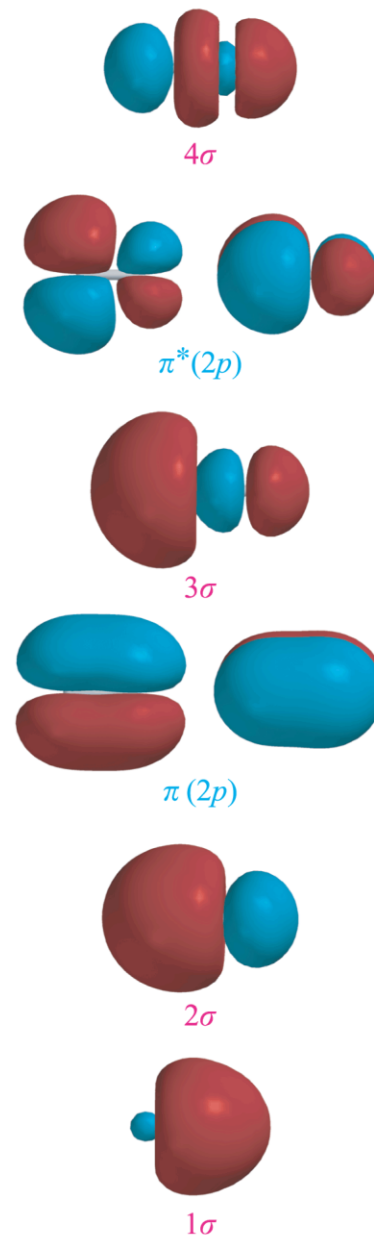
LGO t_{2g}
(t_{1u} t_{2u} t_{1g})

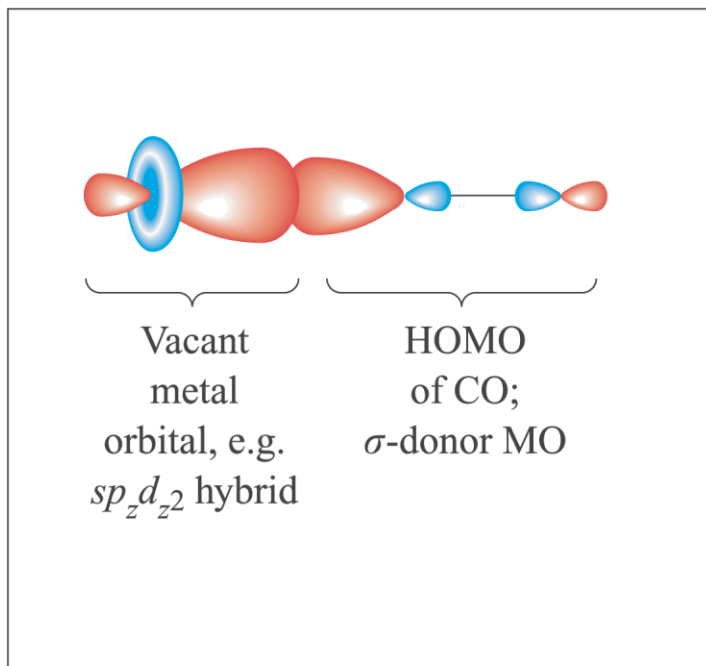
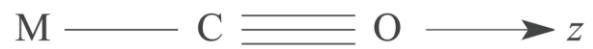


Leganti π -accettori stabilizzano metalli in basso stato di ossidazione

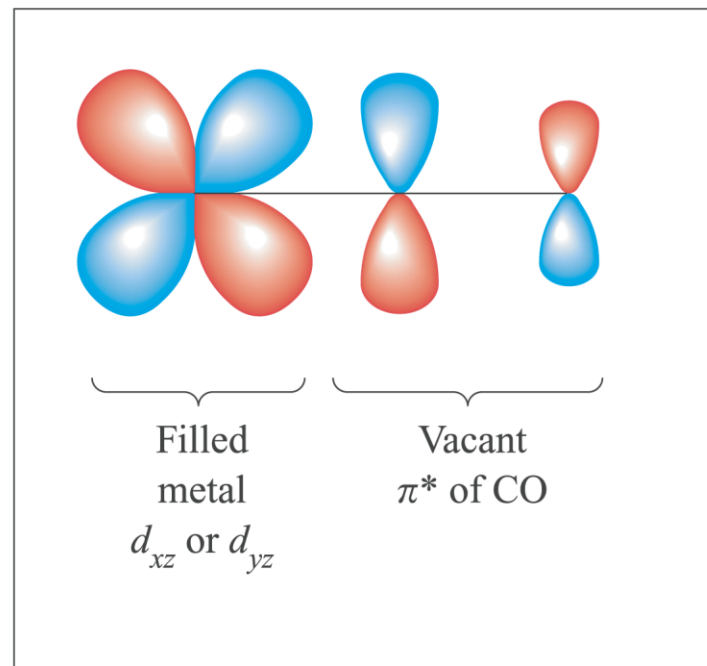


(b)



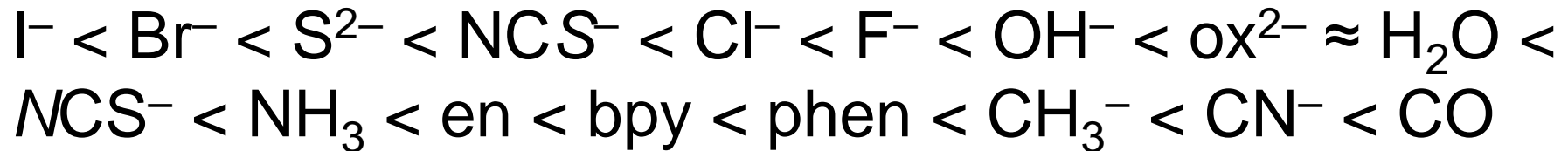


CO-to-M donation
(a)



M-to-CO back-donation
(b)

Serie spettrochimica dei leganti

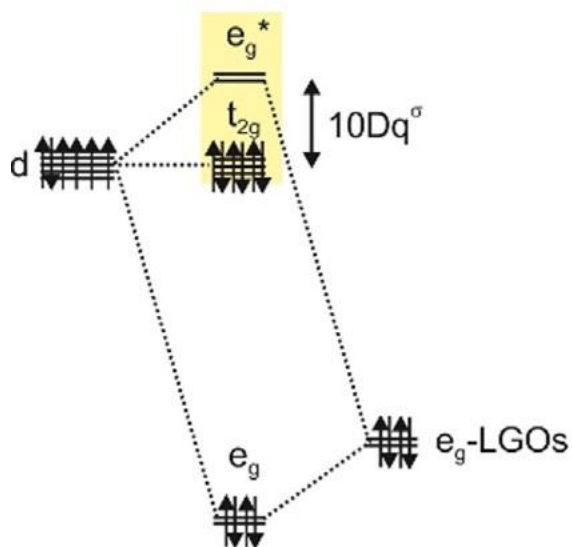


Campo debole

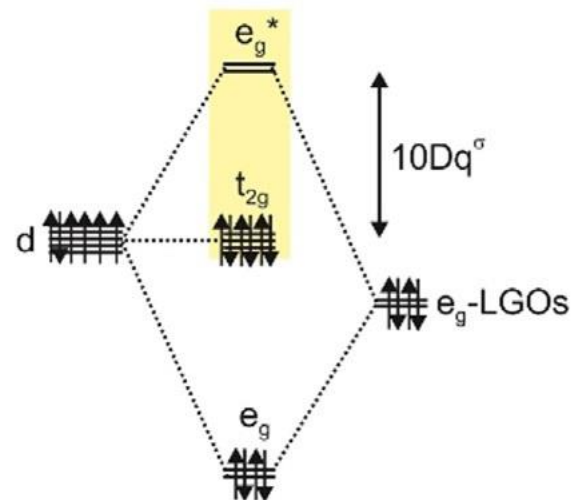
Campo forte

π donatori < π donatori deboli < nessun contributo π < π accettori

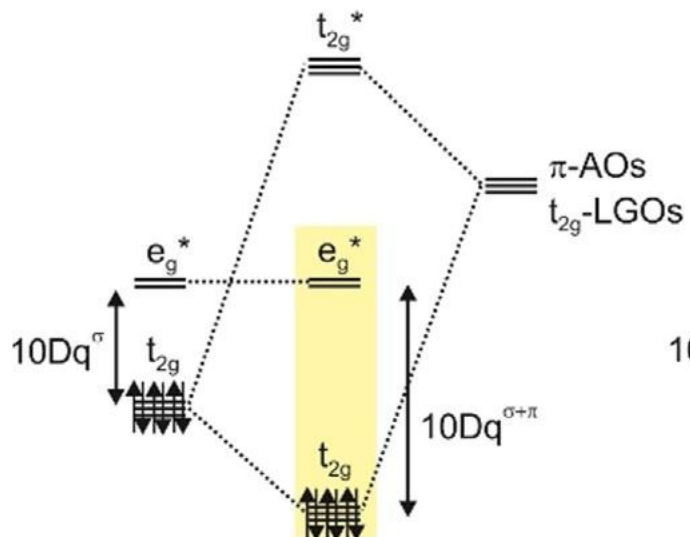
(a) weak σ -donor ligands



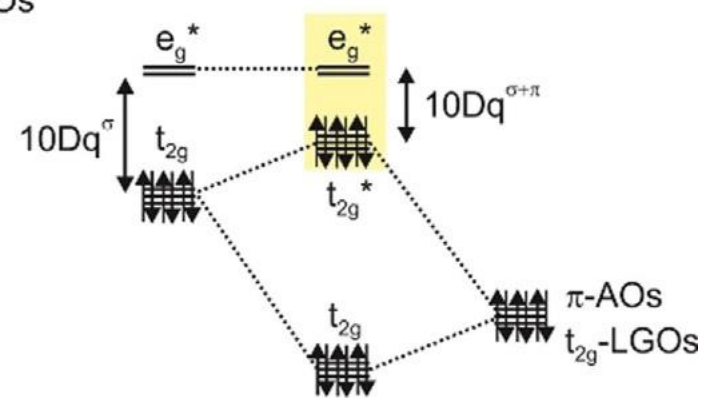
(b) strong σ -donor ligands



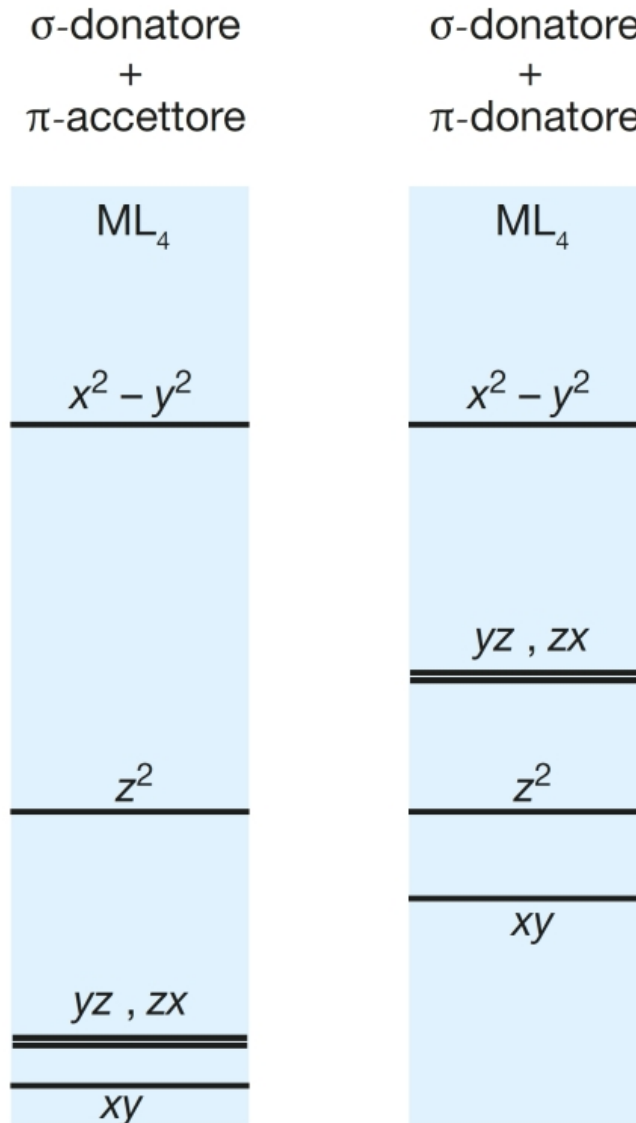
(c) π -acceptor ligands



(d) π -donor ligands



Effetto del contributo π nei planari quadrati



Rispetto al caso in cui si consideravano solo interazioni elettrostatiche, cambiano le energie degli orbitali d di simmetria π , ma è sempre l'orbitale $d_{x^2-y^2}$ ad avere l'energia più alta