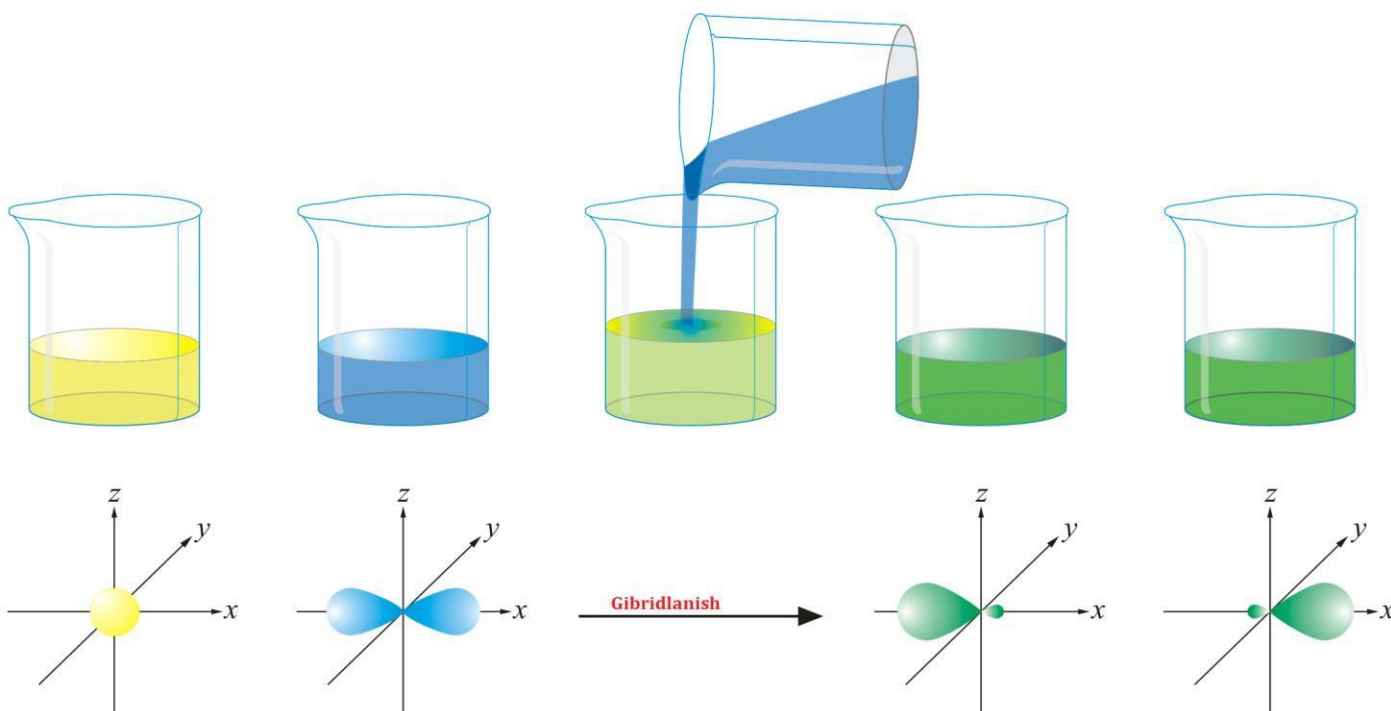


Gibridlanish

Gibridlanish bu: Har – xil shakl va energiyaga ega bo`lgan atom orbitallarining o`zaro birikib yoki tasirlashib bir xil bir – biriga o`xshash energiyali va o`xshash shakilli atom orbitallariga aylanish jarayoniga **gibridlanish** deyiladi (quyida buning vizual(tasvirli)tushunchasi berilgan)



Gibridlanish sababi – Atom orbitallaridan xosil bo`lgan gibrid orbitallarning molekula xosil qilishga va bir – birini qoplashga, kimyoviy bog`ning mutsaxkam bo`lishiga hamda molekulaning energetik barqaror bo`lishiga intilishidir

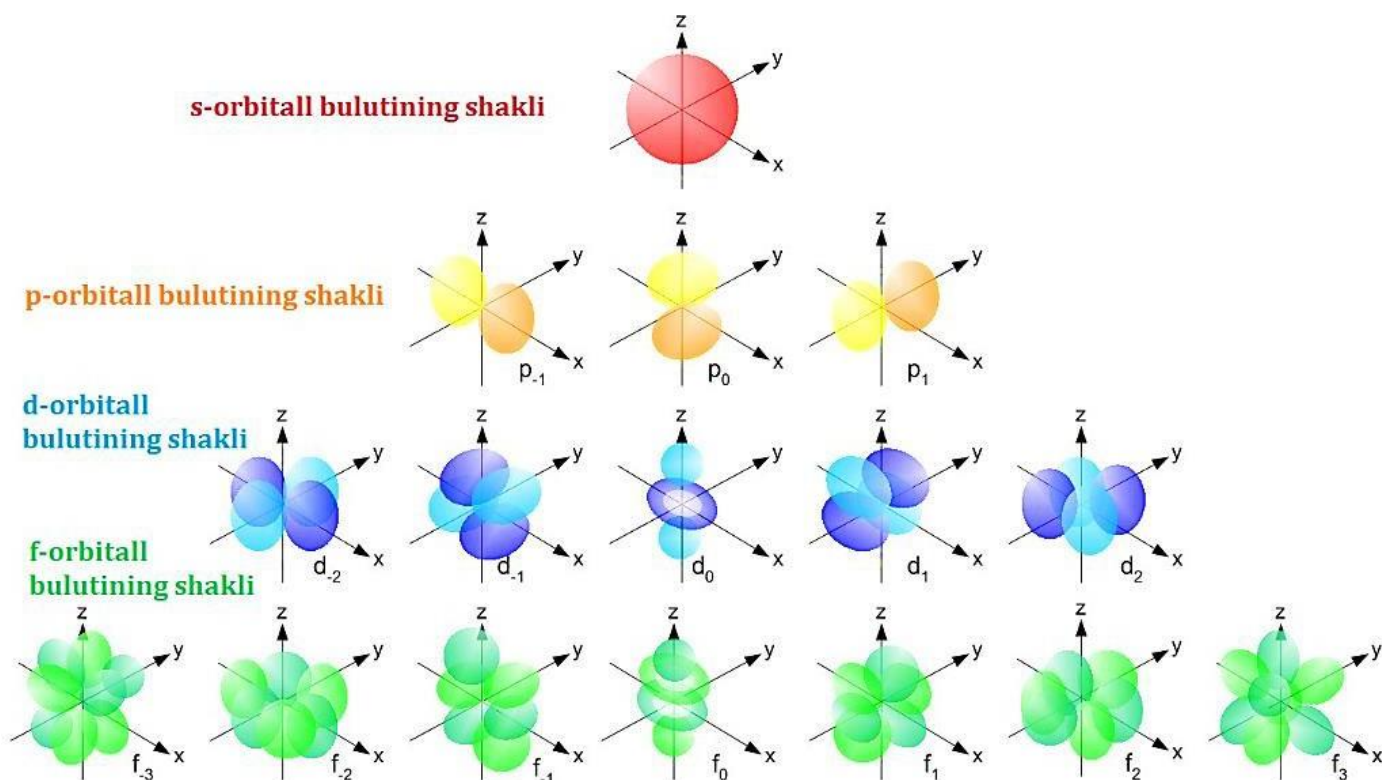
Valent orbitallarining gibridlanish nazariyasi **1934 yilda J. Sleter va L. Poling** tomonidan ishlab chiqilgan

Gibridlanishda – taqsimlanmagan juft elektronlar va σ – bog`lar qatnashadi π – bog`lar esa gibridlanishda ishtrok etmaydi.

Bog`lanishlar orasidagi burchaklar valent burchaklar deyiladi.

Atom orbitallarining gibridlanishi haqidagi tassavurlarga muvofiq turli orbitallarga mansub elektronlar ishtirokida kimyoviy bog`lanish hosil bo`ladi, bu elektronlarning bulutlari bir-biriga ta`sir ko`rsatib, o`z shakllarini o`zgartiradi, natijada turli orbitallarining o`zaro qo`shilishi, ya`ni gibridlangan orbitallar hosil bo`ladi.

Keling gibridlanishni boshlashdan oldin s, p, d, f orbitallarining bulutlari haqida bir eslab olsak



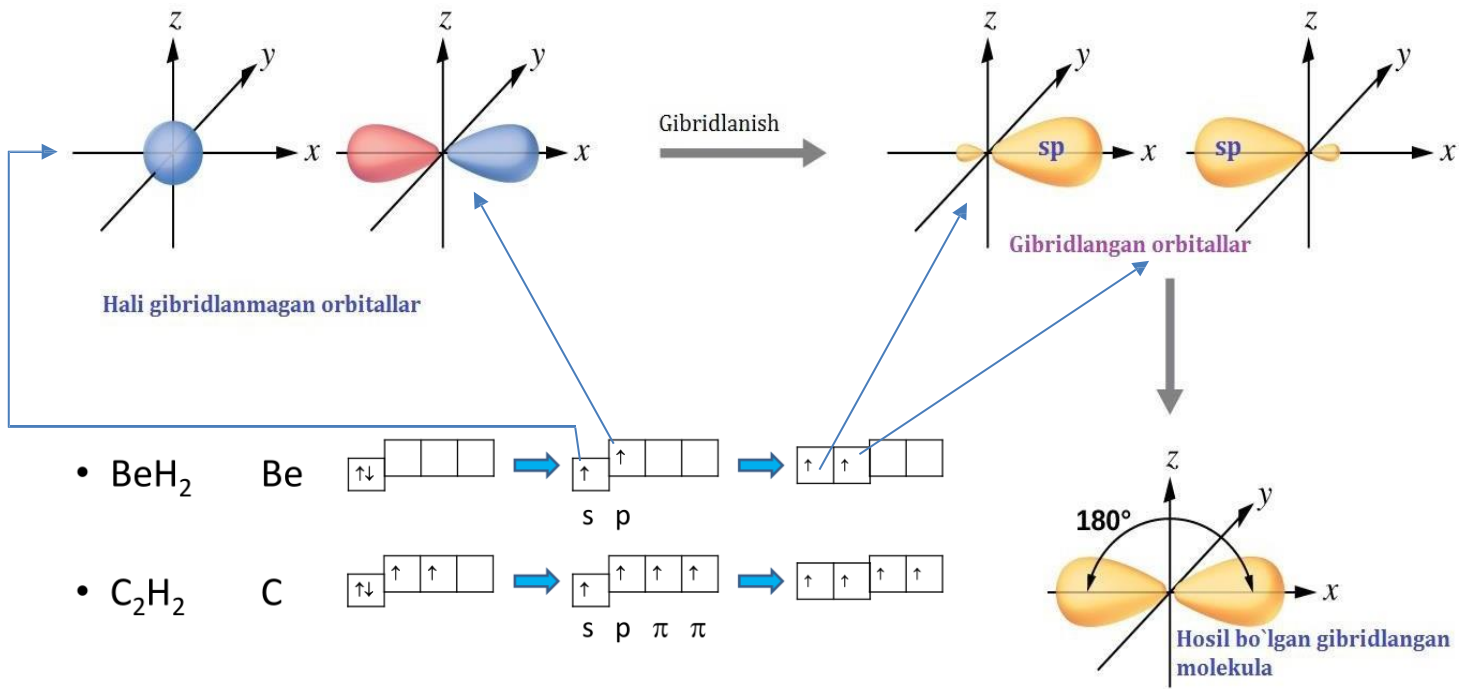
Gibridlanish hosil bo`lishida yuqoridagi atom orbitallarining elektron bulutlari ishtirok etadi. Keling endi gibridlanishni umumiy hosil bo`lish sxemalari bilan bir tanishib chiqsak, gibridlanish bir necha hil yani sp , sp^2 , sp^3 , $dsp^3(sp^3d)$, $sp^3d^2(d^2sp^3)$ ko`rinishlarda bo`ladi.

Gibridlanish bosqichlari :

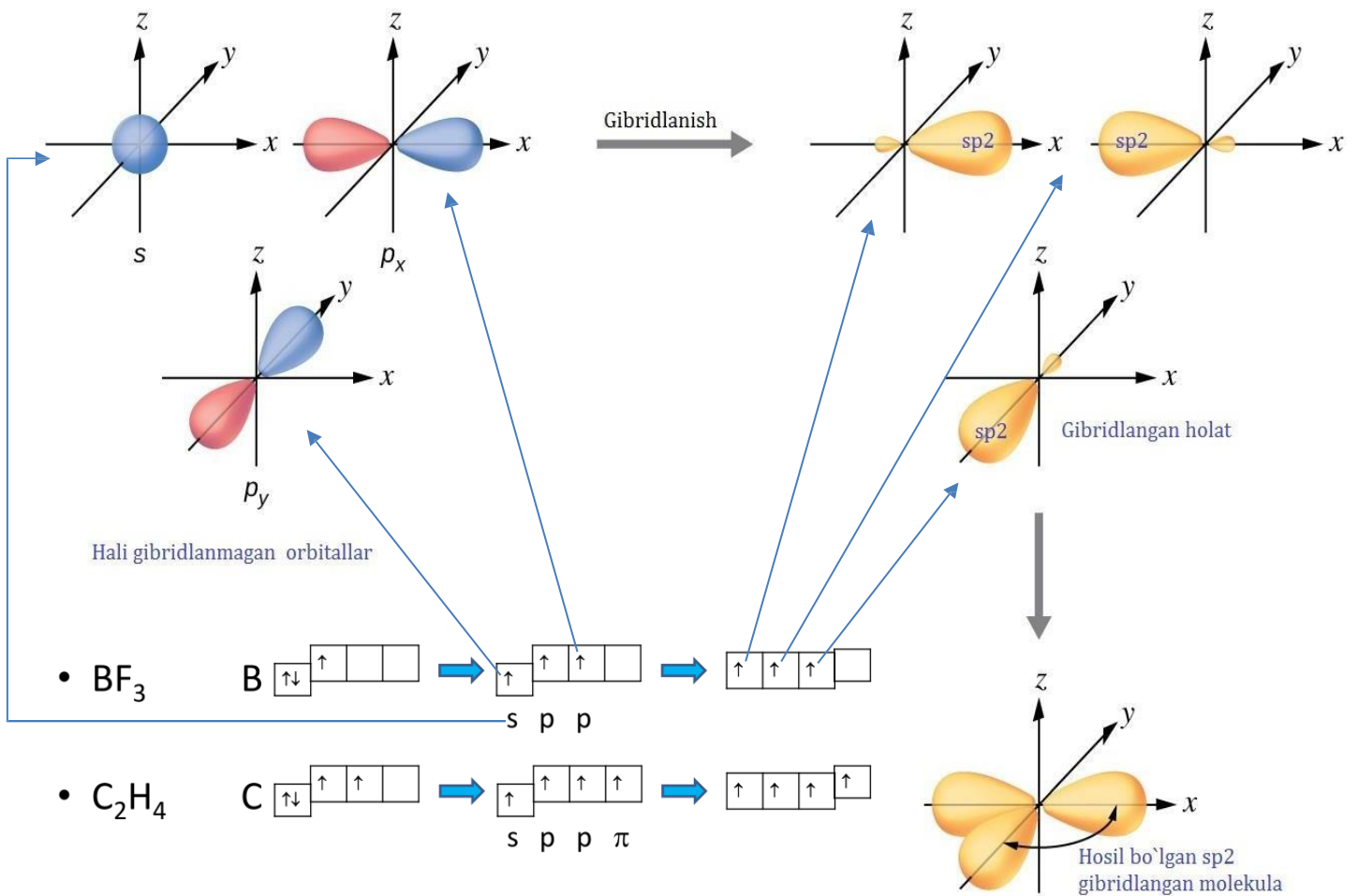
- 1 – Gibridlanishda birinchi galda atomdagi elektronlar qo`zg`algan holatga o`tadi.***
- 2 – bosqichda esa gibridlanishda ishtirok etayotgan orbitallar o`zaro tasirlashadi va bir xil gibrid orbitallarni hosil qiladi.***
- 3 – Bosqichda esa hosil bo`lgan gibrid orbitallar o`zaro tasirlashib gibridlangan molekulani hosil qiladi.***

Quyida ularning hosil bo`lish mehanizmi vizual(tasvirli)usulda berilgan. 😊

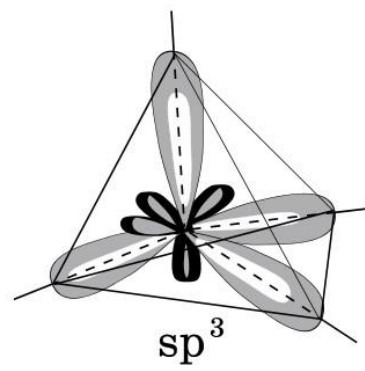
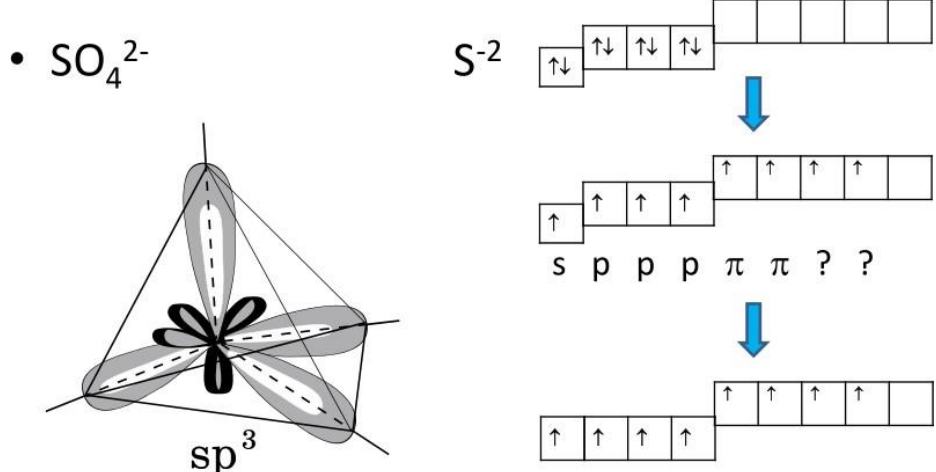
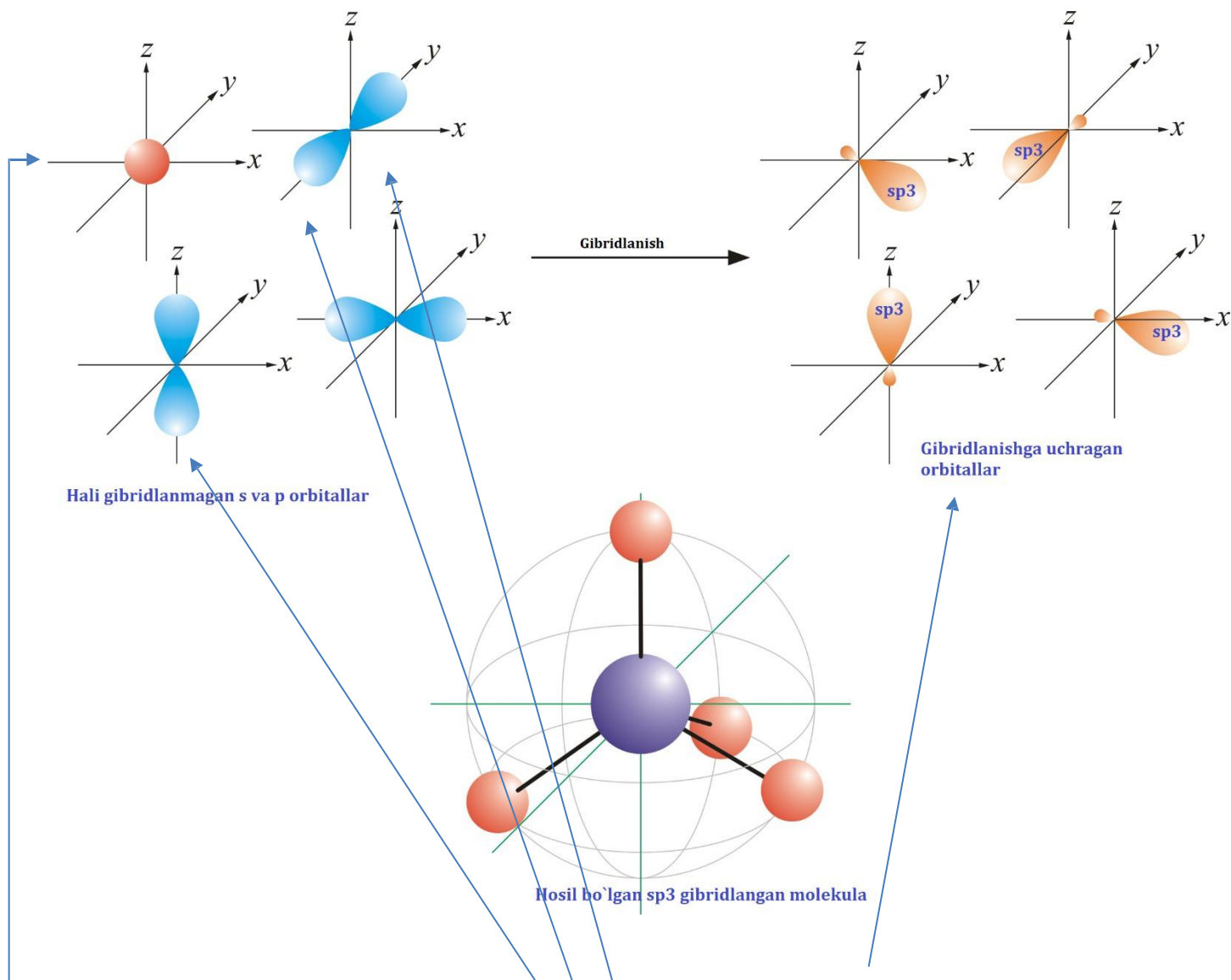
sp – Gibridlanish



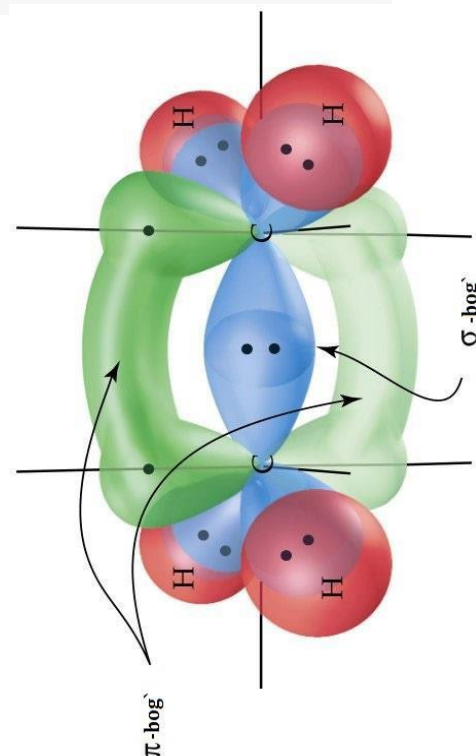
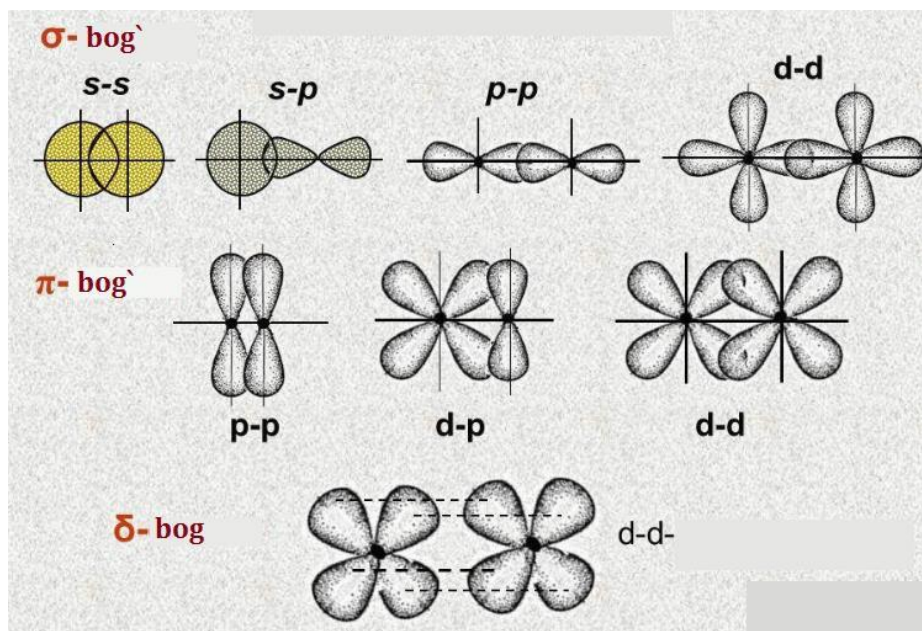
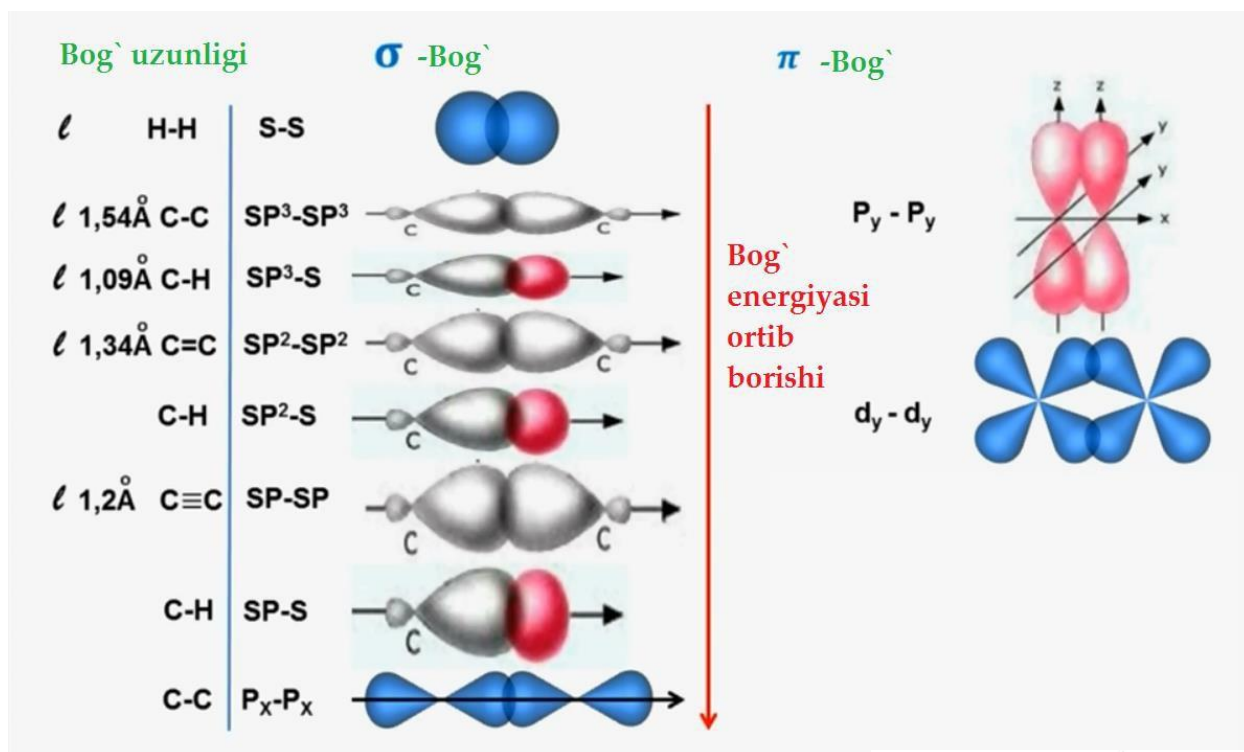
sp² – Gibridlanish



sp³ – Gibridlanish

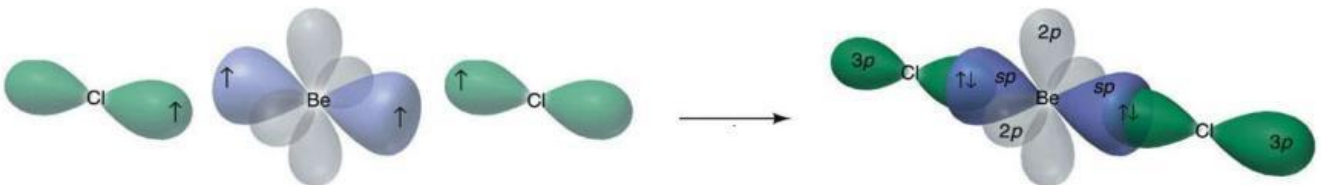
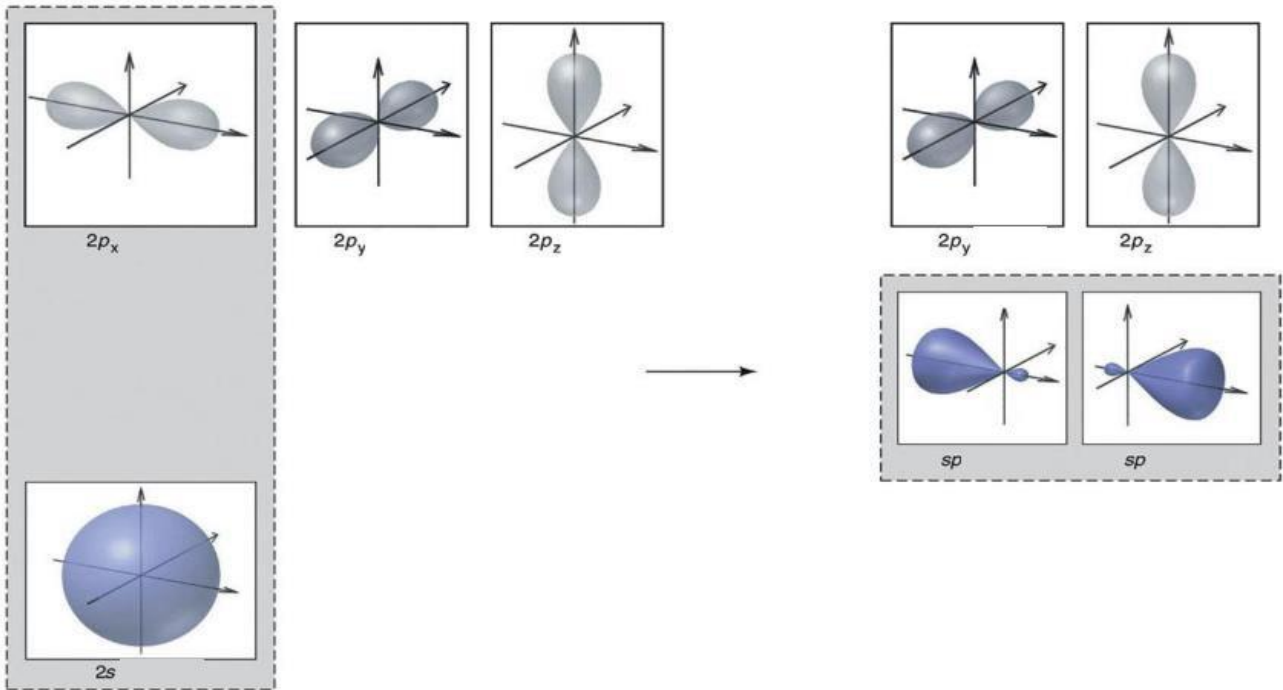
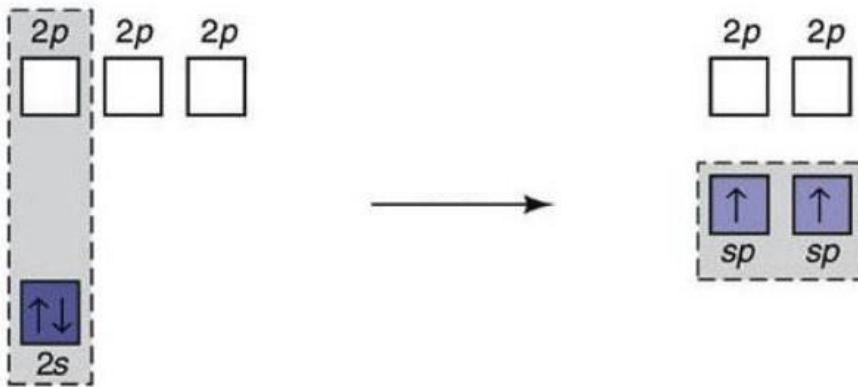
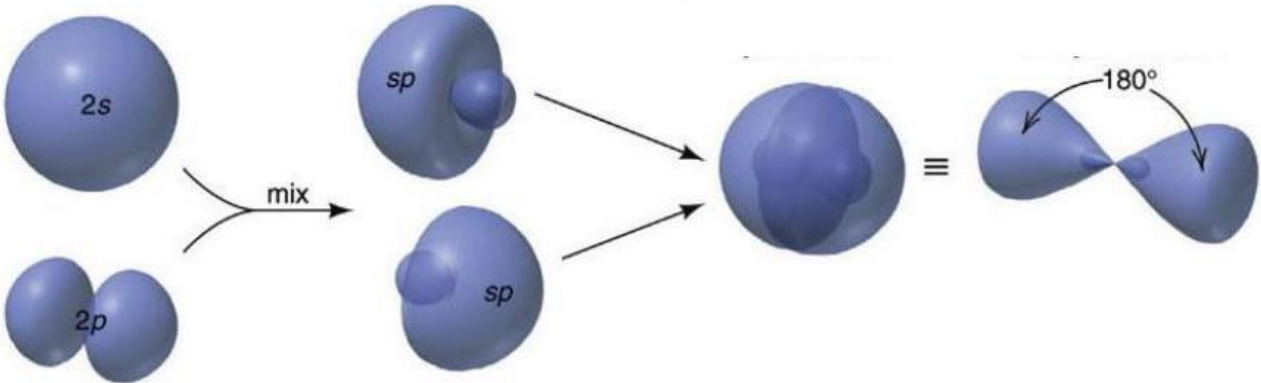


Demak gibridlanish yuqoridagi ko`rinishlarda amalga oshar ekan keling endi gibridlanishini boshqa molekular misolida batafsilroq ko`rib chiqsak bundan avval esa kovalent bo`glanishni hosil qilishda ishtrok etadigan σ va π bog`lanishlarning bazi ko`rinishlarini va elektron bulutlar bir birini qanday qopashini bir ko`rib o`tsak.

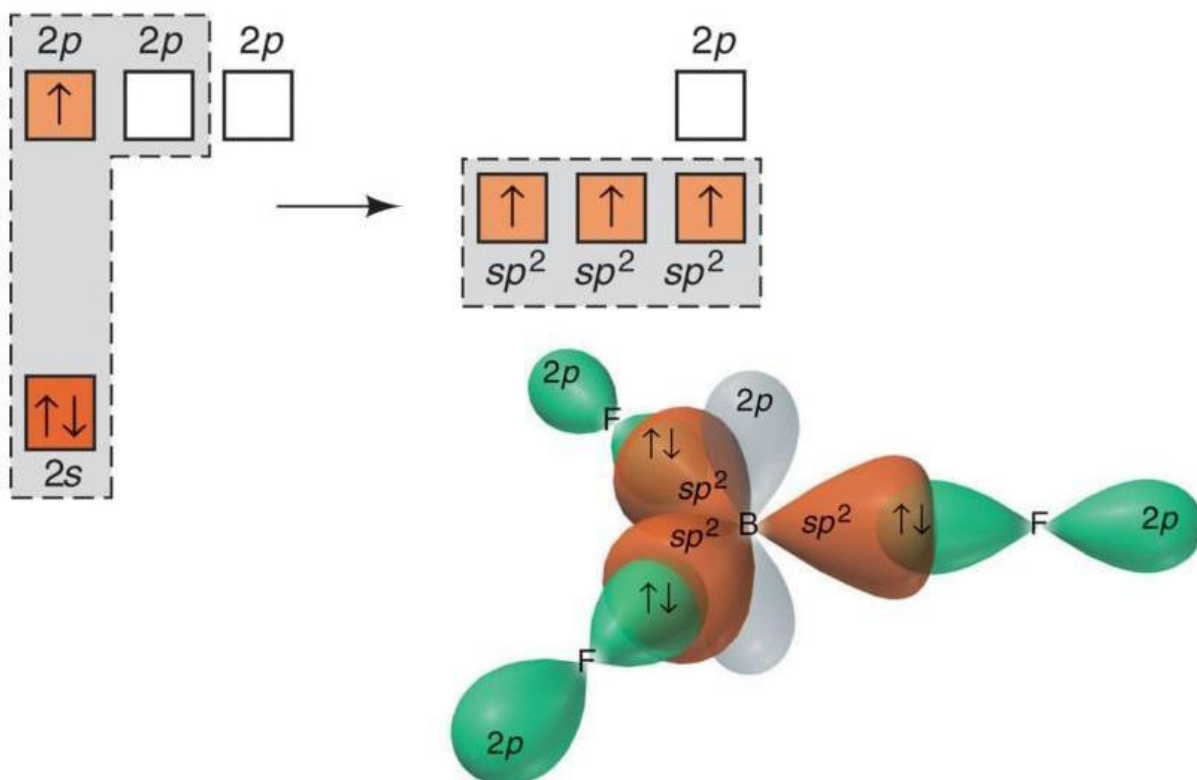
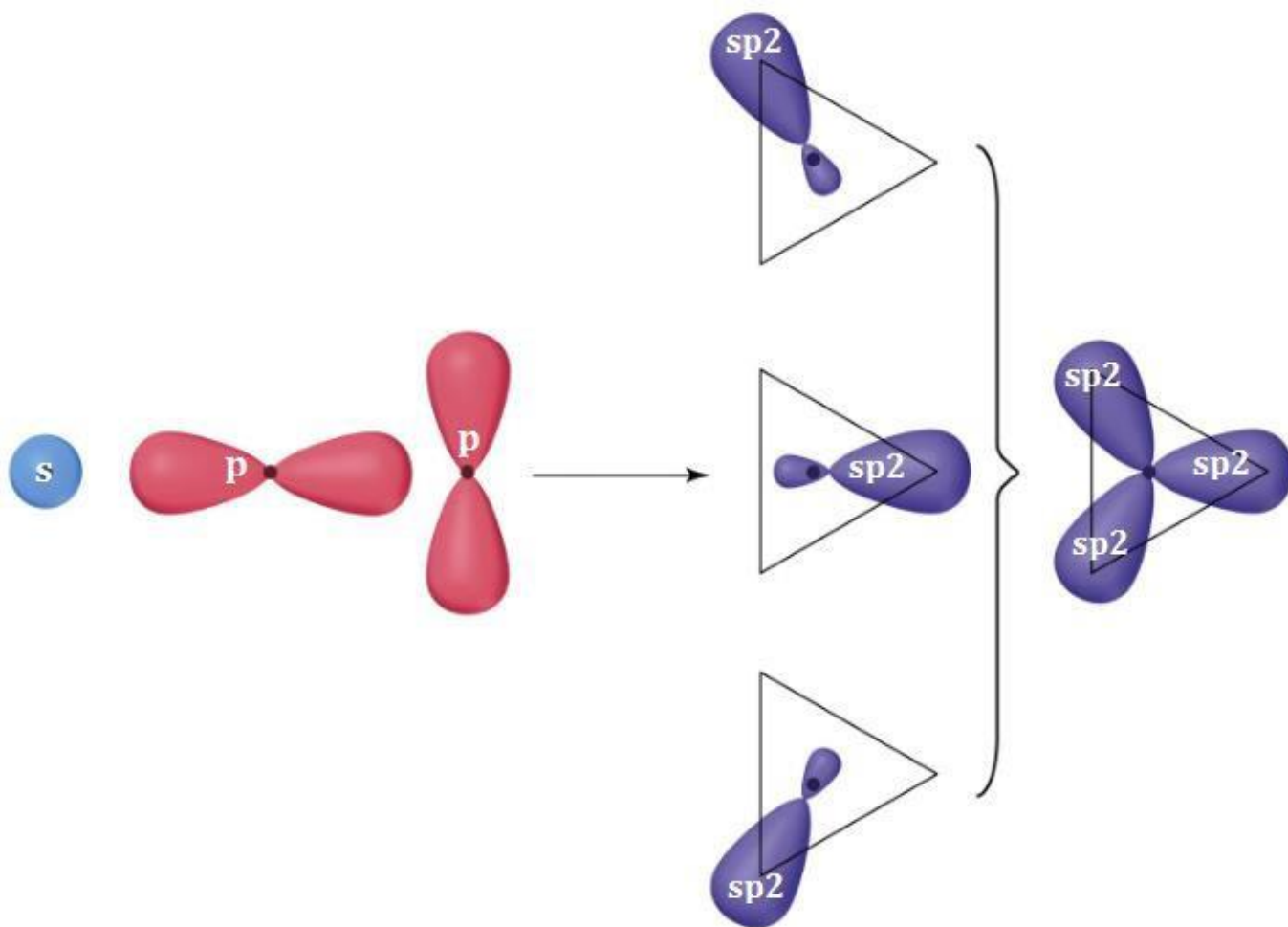


Ushbu tasvirda bog` uzunligi, sigma va pi bog`lanish hamda elektron bulutlar bir birini qanday qoplashi haqida yaqqol tasavvurga ega bo`lish mumkin.

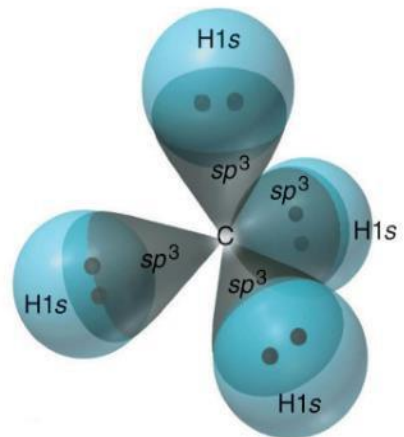
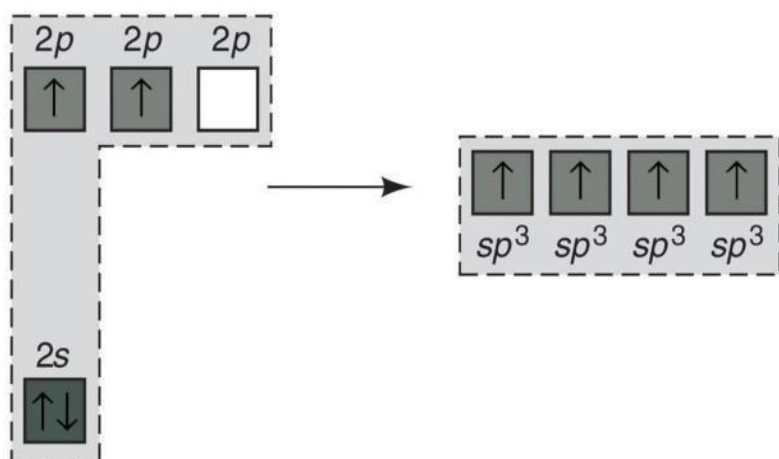
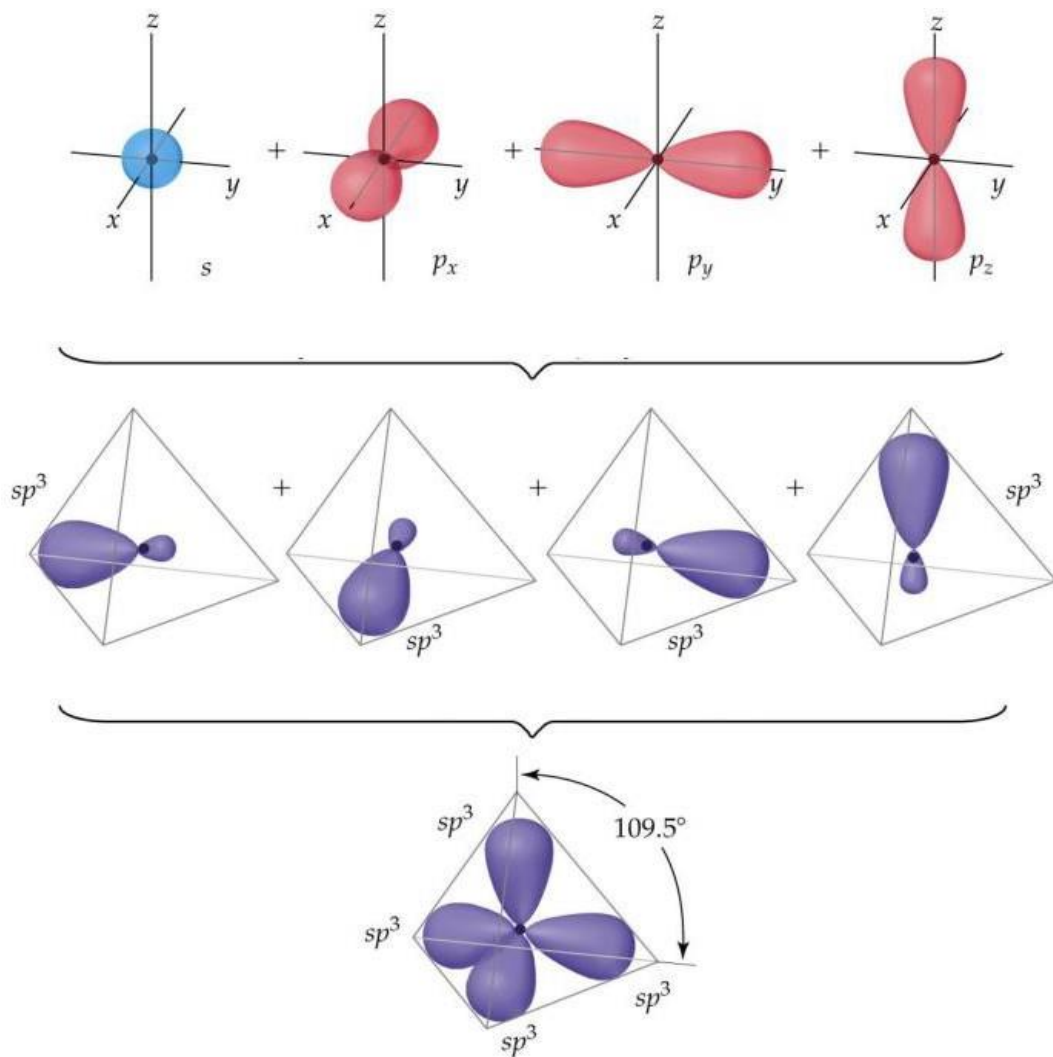
sp – Gibridlanish



sp^2 – Gibridlanish

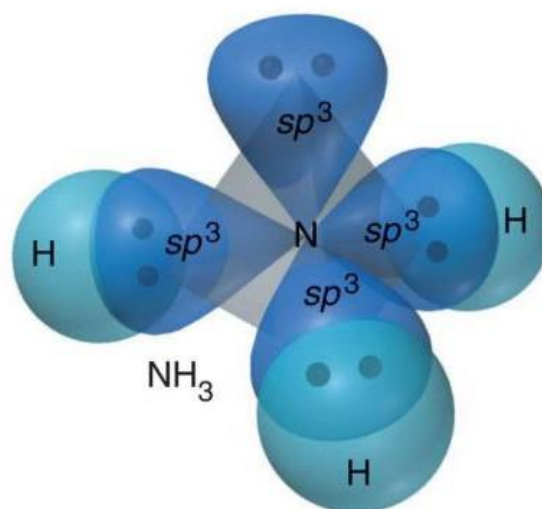
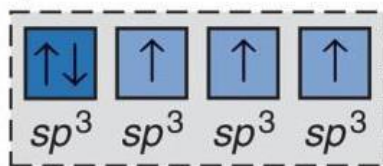
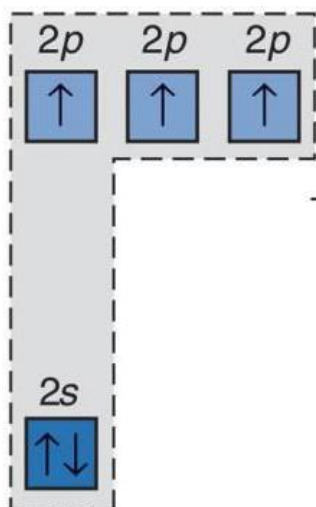


sp^3 – Gibridlanish

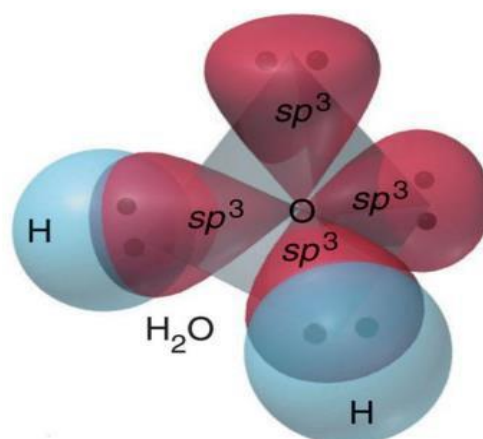
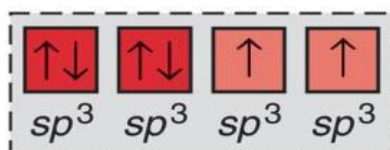
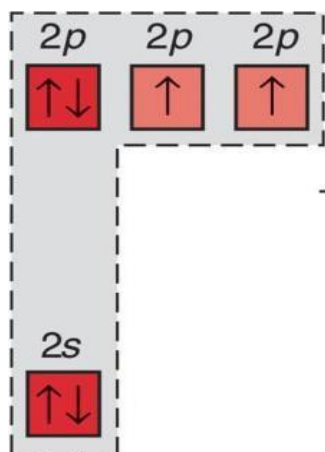


sp^3 – Gibridlanish

NH_3 molekulasining hosil bo'lishi

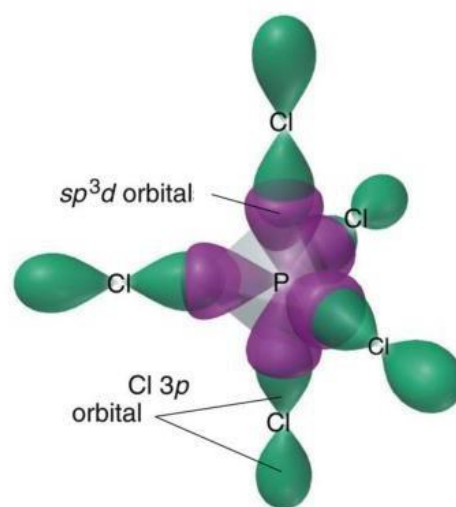
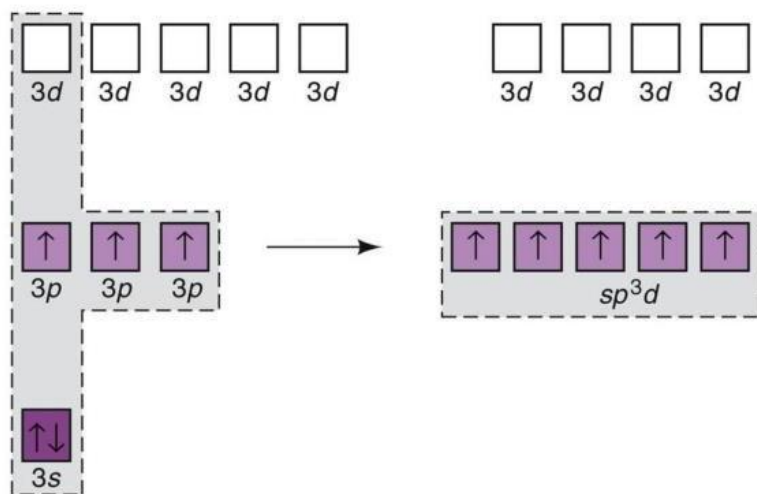


H_2O molekulasining hosil bo'lishi

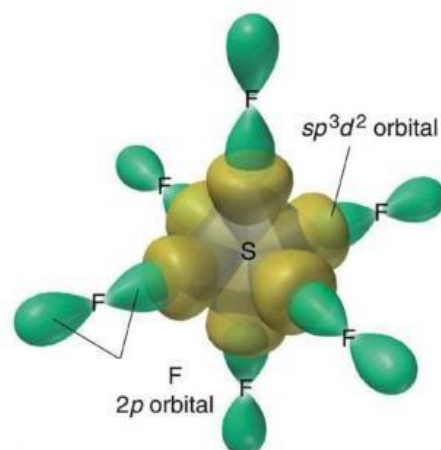
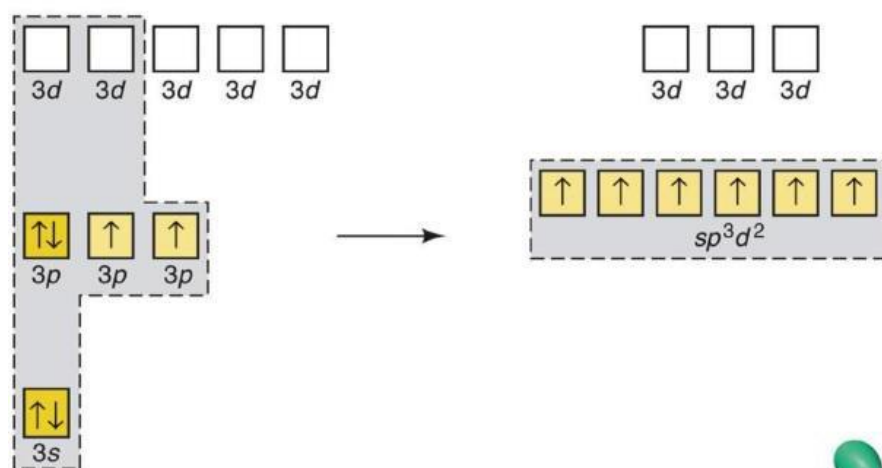


dsp^3 va d^2sp^3 – Gibridlanish

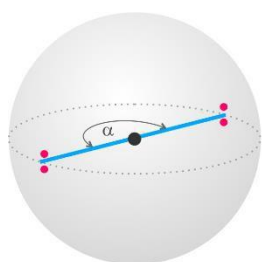
sp^3d PCl_5 .



sp^3d^2 SF_6 .

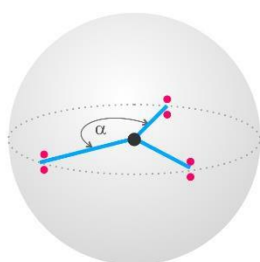


Endi esa yuqoridagi ko`rib chiqqan molekularimizni fazoviy tasviri bilan ham tanishib o`tsak.



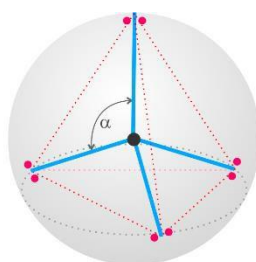
chiziqli

$$\alpha = 180^\circ$$



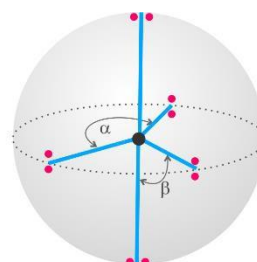
yassi uchburchak

$$\alpha = 120^\circ$$



tetraeder

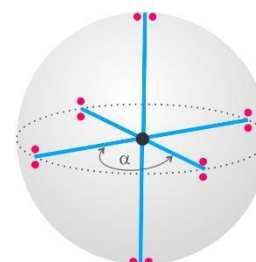
$$\alpha = 109^\circ 28'$$



trigonal bipiramida

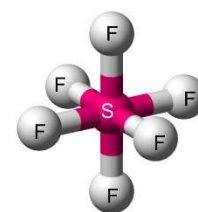
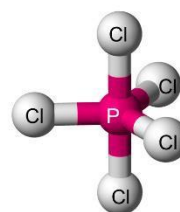
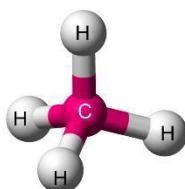
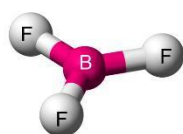
$$\alpha = 120^\circ$$

$$\beta = 90^\circ$$



oktaedr

$$\alpha = 90^\circ$$


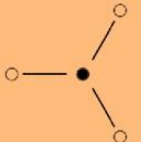
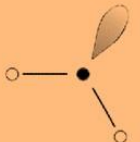


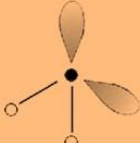
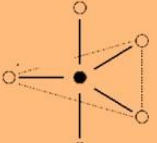
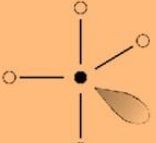
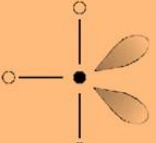
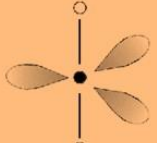

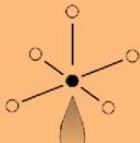
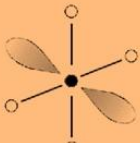
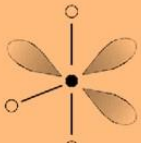
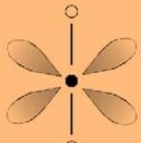


BULARNI YOD OLIAMIZ!!!

sigma bog`lar soni	gibridlanish turi	misollar
2	sp	BeCl ₂ , HgCl ₂ , C ₂ H ₂ , CO ₂ , CO, CdCl ₂ , ZnCl ₂ etc.
3	sp ²	BCl ₃ , AlCl ₃ , C ₂ H ₄ , C ₆ H ₆ , SO ₂ , SO ₃ , HNO ₃ , H ₂ CO ₃ , SnCl ₂ , PbCl ₂ etc.
4	sp ³	NH ₄ ⁺ , BF ₄ ⁻ , H ₂ S, H ₂ SO ₄ , HClO ₄ , PCl ₃ , NCl ₃ , AsCl ₃ , HClO ₃ , ICl ₂ ⁺ , OF ₂ , HClO ₂ , SCl ₂ , HClO, ICl, XeO ₃ etc.
5	sp ³ d	PCl ₅ , SbCl ₅ , SF ₄ , ClF ₃ , BrF ₃ , XeF ₂ , ICl ₂ ⁻ etc.
6	sp ³ d ²	SF ₆ , AlF ₆ ³⁻ , SiF ₆ ²⁻ , PF ₆ ⁻ , IF ₅ , BrF ₅ , XeOF ₄ , XeF ₄ , BrF ₄ ⁻ , ICl ₄ ⁻ etc.
7	sp ³ d ³	IF ₇ , XeF ₆ etc.

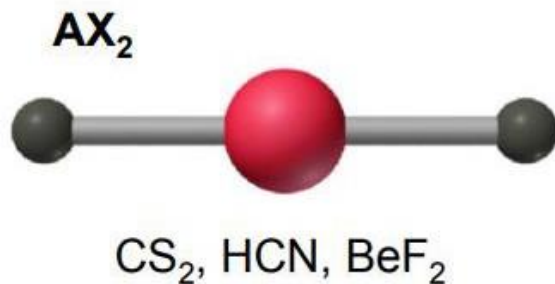
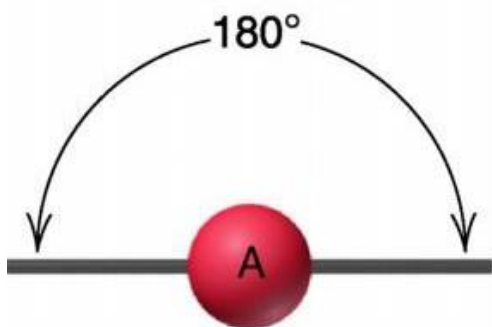
sp	s + p
sp²	s + p + p
sp³	s + p + p + p
sp³d	s + p + p + p + d
sp³d²	s + p + p + p + d + d

Endi esa gibrirlanishni turlari va sxemalari bilan batafsil tanishamiz

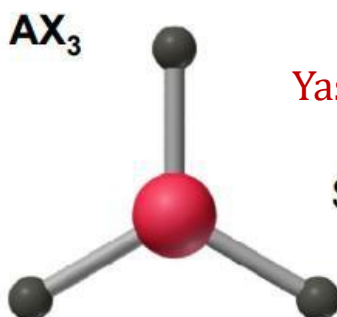
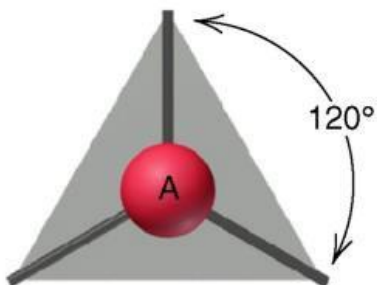
1	Gibrirlanishga ega emas chiziqli : 180°				
	LiH				
2	Gibrirlanish : sp				
	AX_2  chiziqli CO_2				
3	Gibrirlanish : sp^2				
	AX_3  yassi uchburchak BF_3	AX_2E  burchakli SO_2			
4	Gibrirlanish : sp^3				
	AX_4  tetraedr CH_4	AX_3E  trigonal piramida NH_3	AX_2E_2  burchakli H_2O		
5	Gibrirlanish : sp^3d				
	AX_5  trigonal bipiramida PF_5	AX_4E  tekis kvadrat SF_4	AX_3E_2  T-shaklida ClF_3	AX_2E_3  chiziqli I_3^-	
6	Gibrirlanish : sp^3d^2				
	AX_6  oktaedr SF_6	AX_5E  Kvadrat piramida BrF_5	AX_4E_2  Tekis kvadra KrF_4	AX_3E_3  T-shaklida XeF_3^-	AX_2E_4  Aniqlanmagan
	0	1	2	3	4
markaziy atomning bo'sh elektron juftlar soni					

Quyida har bitta gibridlangan molekulani 2D – o`lchamli tasvirlari yorqinroq tasvirlangan

sp – gibridlanish



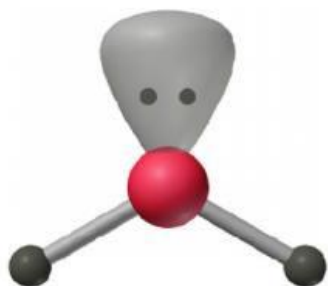
sp² – gibridlanish



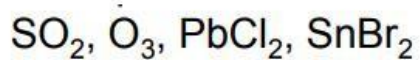
Yassi *sp²* uchburchakli molekularlar



AX_2E

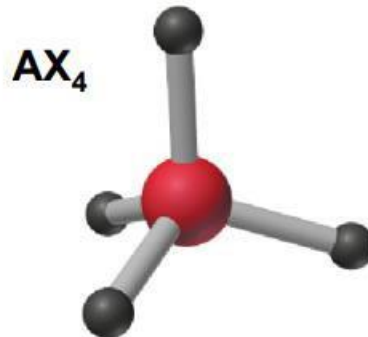
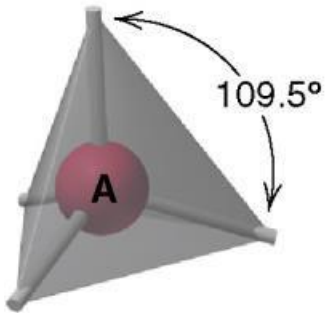


Burchakli *sp²* molekularlar

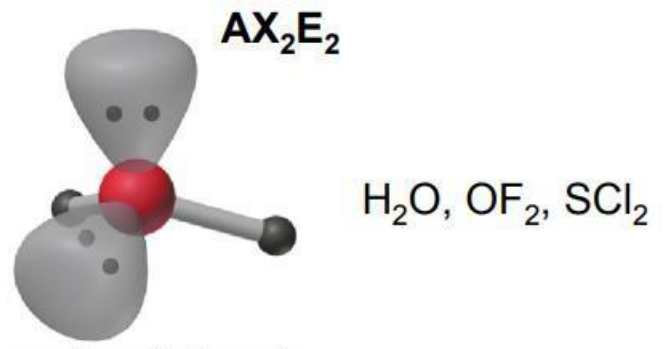
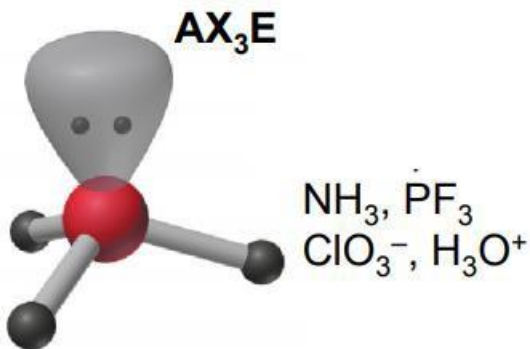


sp³ – gibridlanish

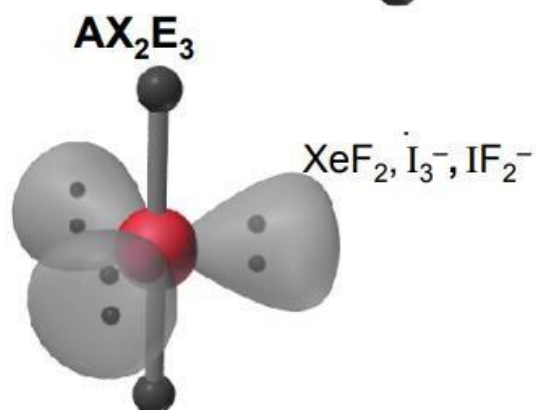
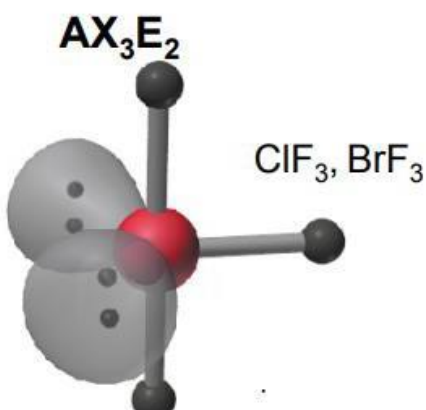
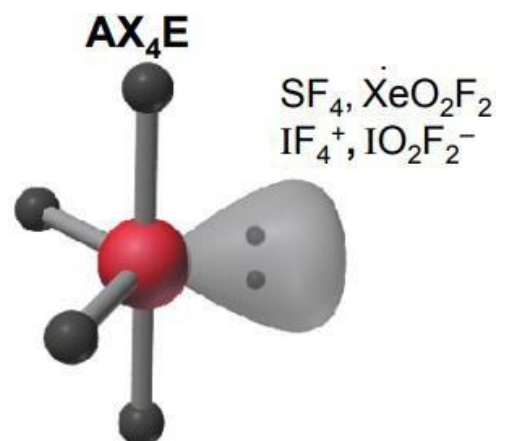
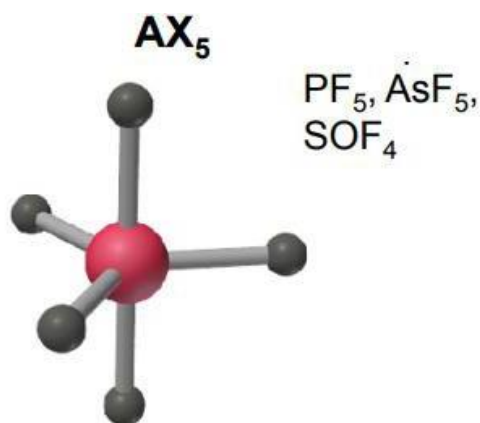
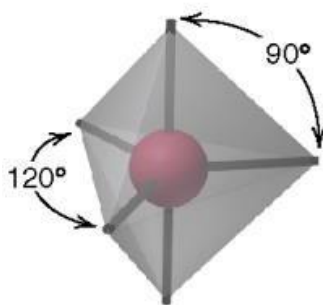
k



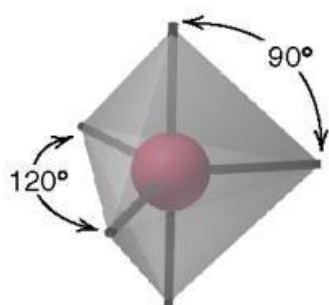
CH₄, SiCl₄,
SO₄²⁻, ClO₄⁻



dsp³ – gibridlanish



d^2sp^3 – gibridlanish

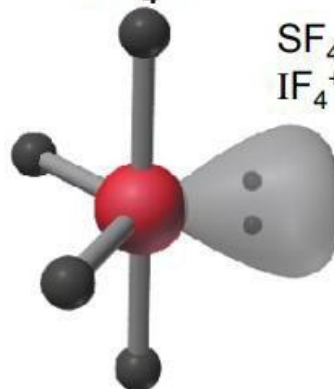


AX₅



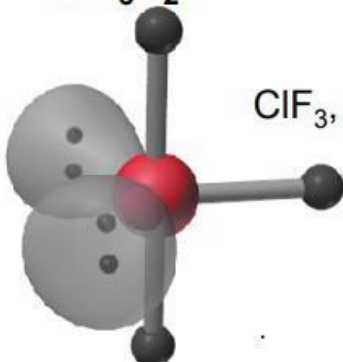
PF₅, AsF₅,
SOF₄

AX₄E



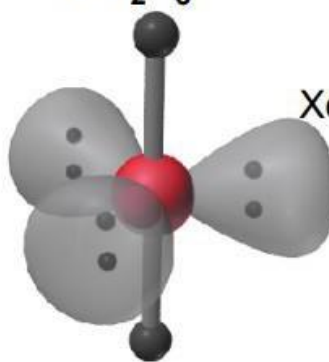
SF₄, XeO₂F₂
IF₄⁺, IO₂F₂⁻

AX₃E₂



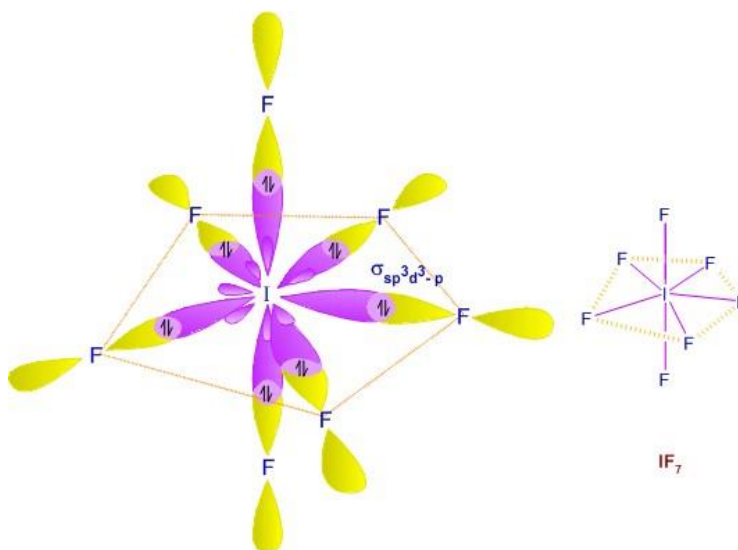
ClF₃, BrF₃

AX₂E₃



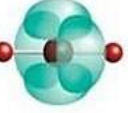
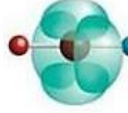

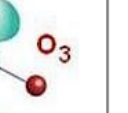



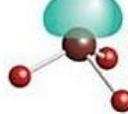
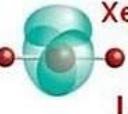
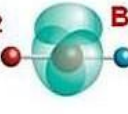
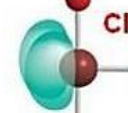


XeF₂, I₃⁻, IF₂⁻

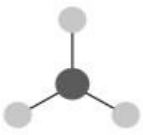

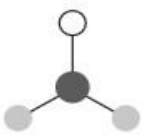


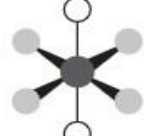

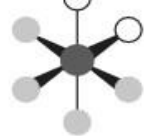




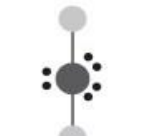



d^3sp^3 – gibridlanish



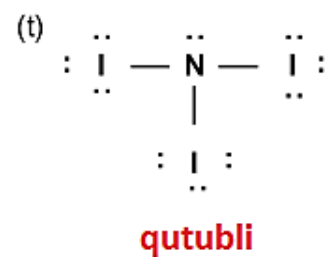
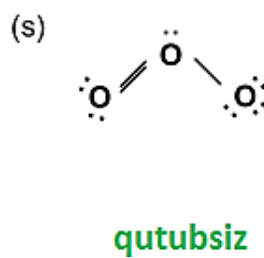
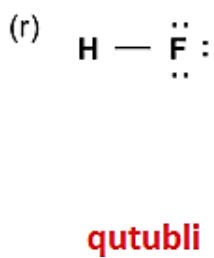
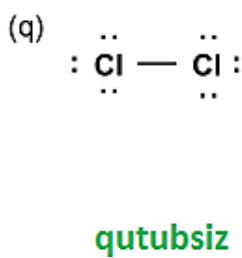
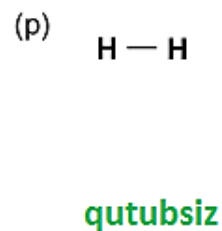
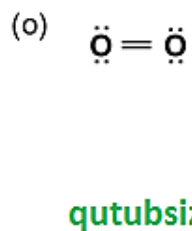
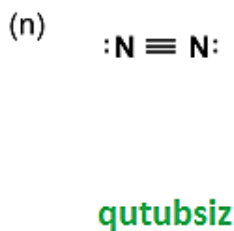
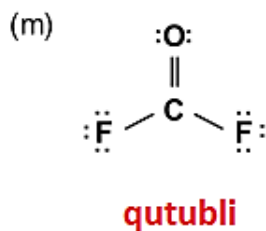
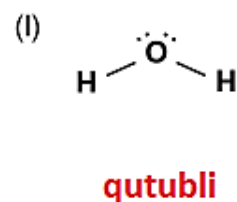
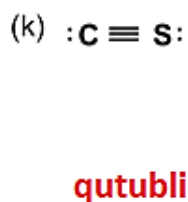
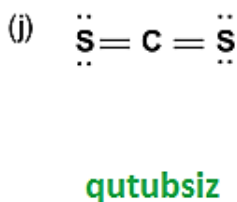
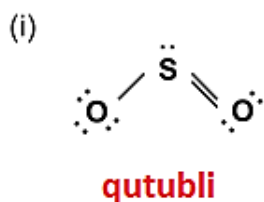
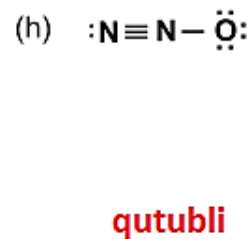
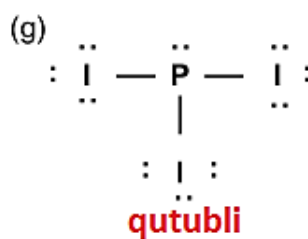
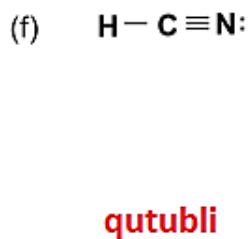
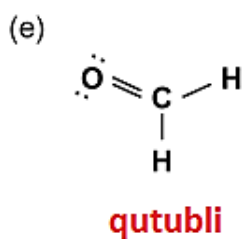
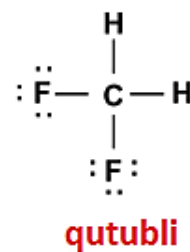
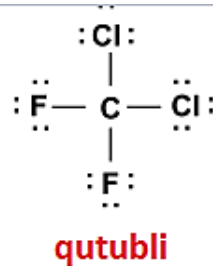
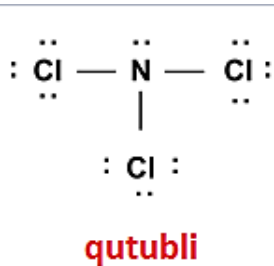
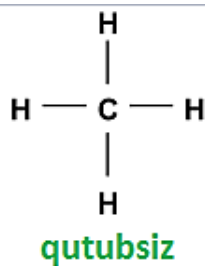
Molekulalarni qutubli va qutubsizga ajratish va ularga misollar

tip	qutubsiz	qutubli	tip	qutubsiz	qutubli
AX ₂			AX ₂ E ₄		
AX ₂ E			AX ₃		
AX ₂ E ₂			AX ₃ E		
AX ₂ E ₃			AX ₃ E ₂		

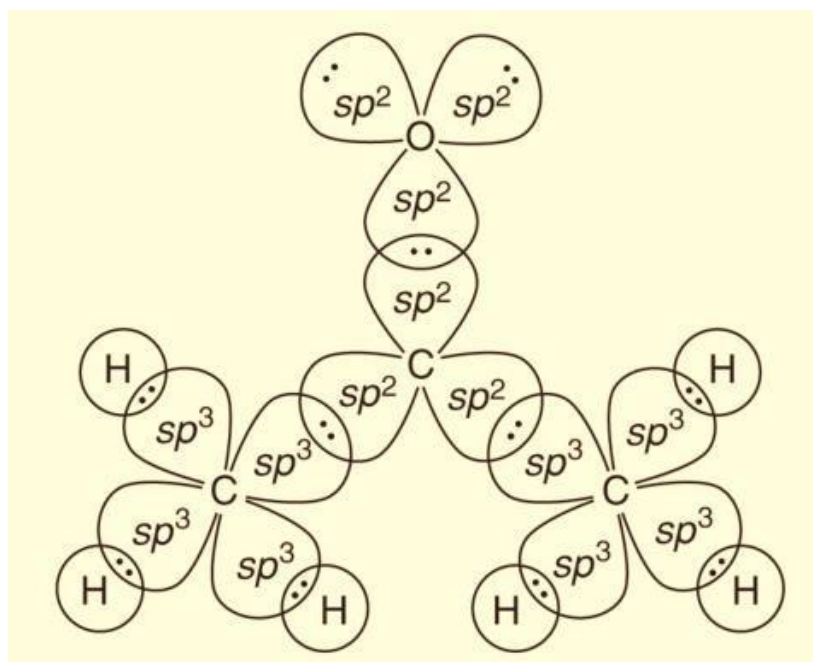
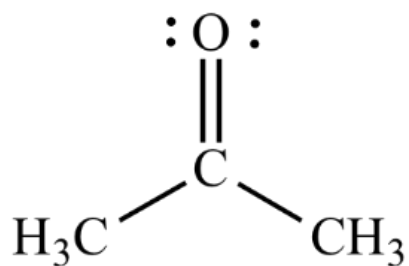
Ularni quyidagi sxemalar bo'yicha ajratish mumkin!

qutubsiz molekula		qutubli molekula	
			
			
			
			

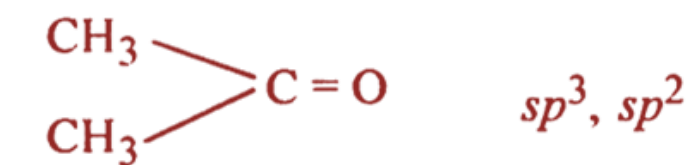
qutubli va qutubsiz molekularni shbu misollarda ko`rish mumkin:



Gibridlangan atom orbitallarni aniqlash usuli



Misollar:



Endi esa koordinatsion birikmalarni gibridlanish turini aniqlaymiz buning uchun ularning koordinatsion sonini bilish muxim.

atom ion kompleks	Elektron tuzilishi	OKD	Gibridlanish
$\text{Ni}^{2+} (d^8)$		+2	
$[\text{NiCl}_4]^{2-}$		+2	sp^3
$[\text{Ni}(\text{CN})_4]^{2+}$		+2	dsp^2
Ni		0	
$\text{Ni}(\text{CO})_4$		0	sp^3
$[\text{Ni}(\text{NH}_3)_6]^{2+}$		+2	sp^3d^2
$\text{Mn}^{2+} (d^5)$		+2	
$[\text{Mn}(\text{CN})_6]^{4-}$		+2	d^2sp^3
$[\text{MnCl}_4]^{2-}$		+2	sp^3
$\text{Cu}^{2+} (d^9)$		+2	
$[\text{CuCl}_4]^{2-}$		+2	sp^3
$[\text{Cu}(\text{NH}_3)_4]^{2+}$		+2	dsp^2

