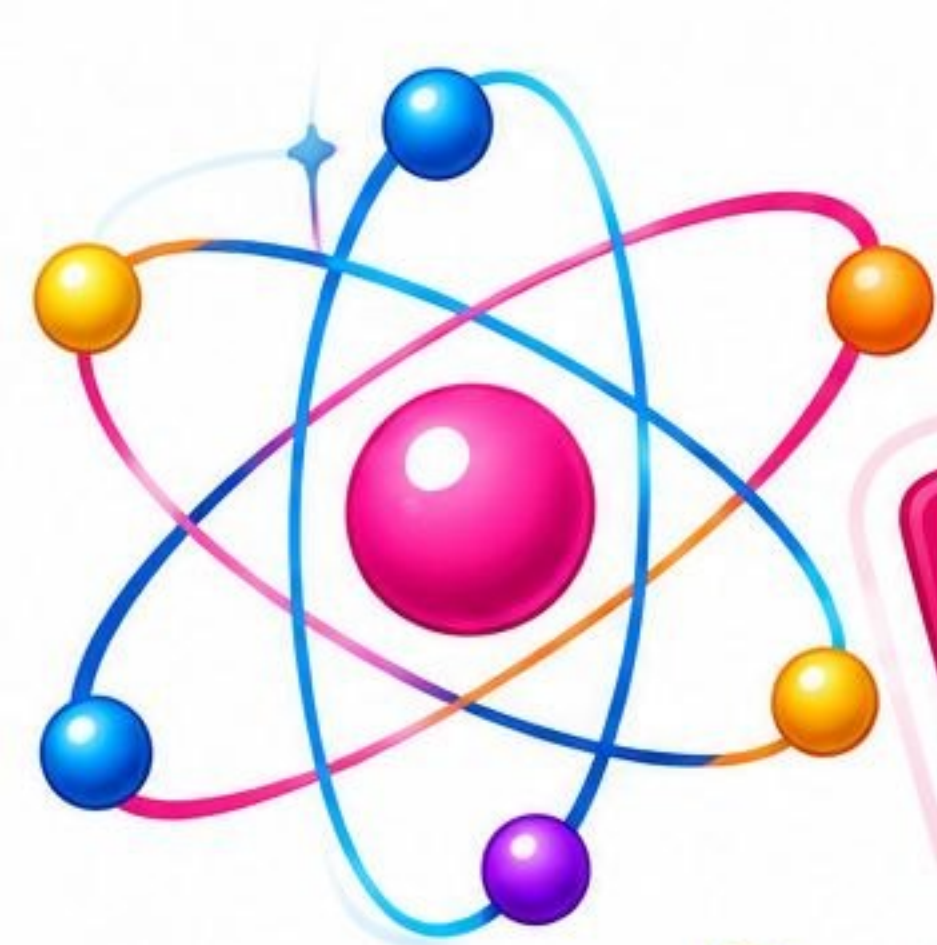
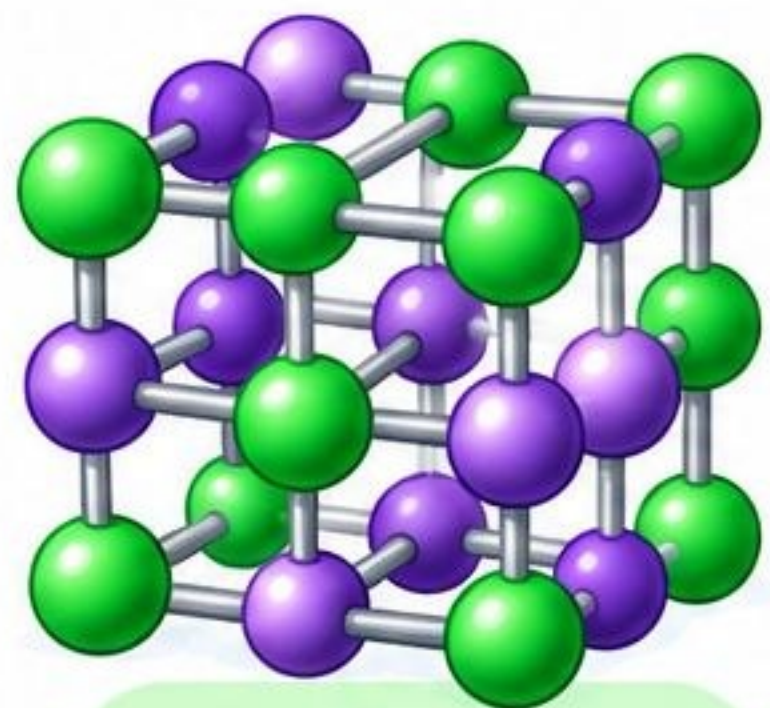


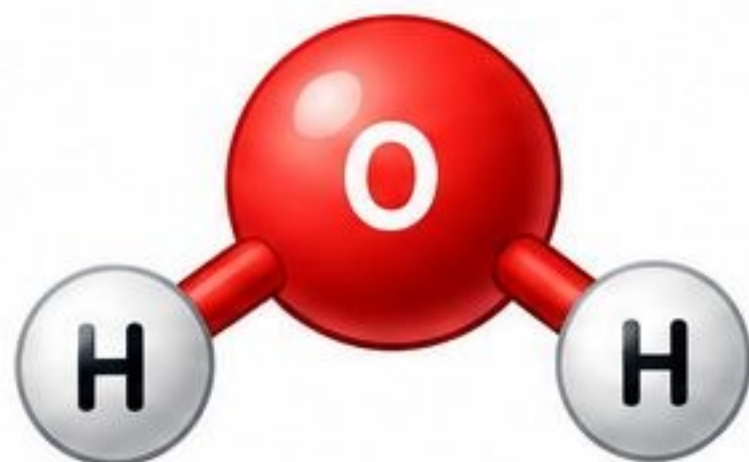


KIMYOVIIY BOG'LANISH TURLARI

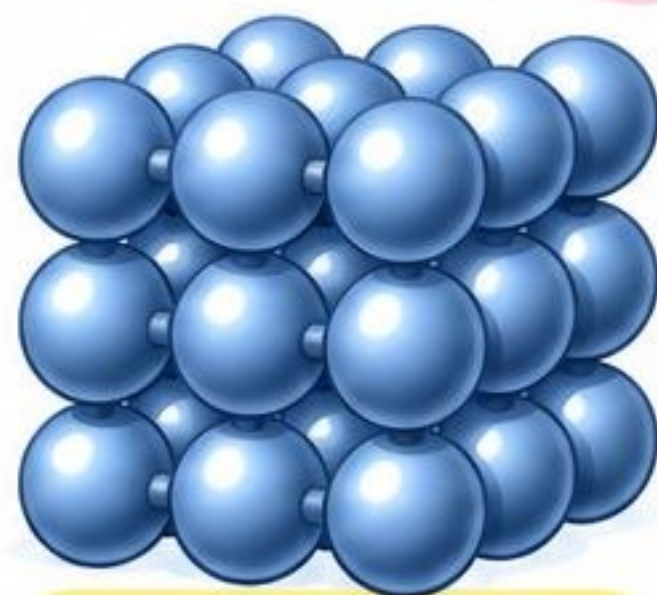
Atomlar
bog'lanadi –
yangi modda
hosil bo'ladi!



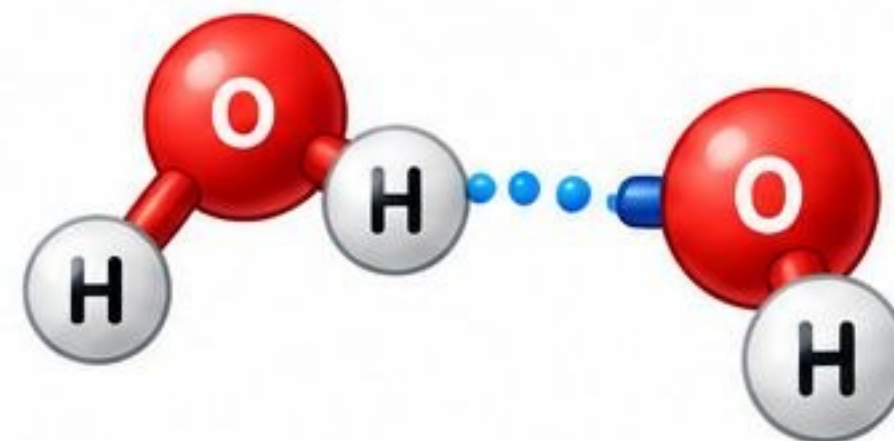
Ion
bog'lanish



Kovalent
bog'lanish



Metall
bog'lanish

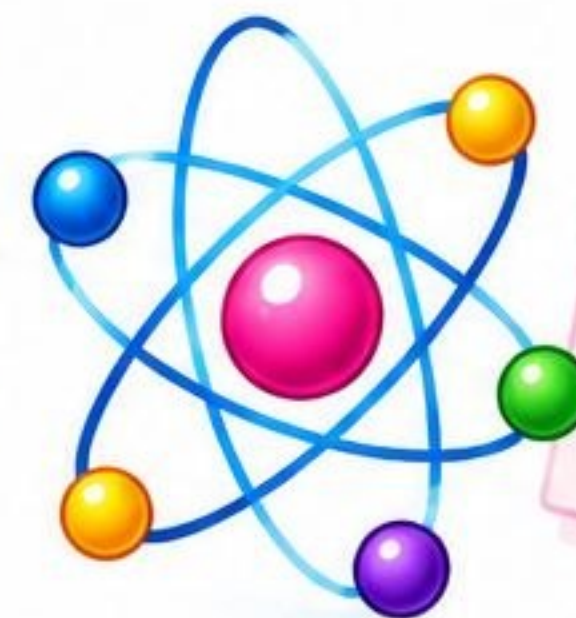


Vodorod
bog'lanish





DARSNING REJASI



Reja
muvaffaqiyatli
darsning
kalitidir! ♥

1

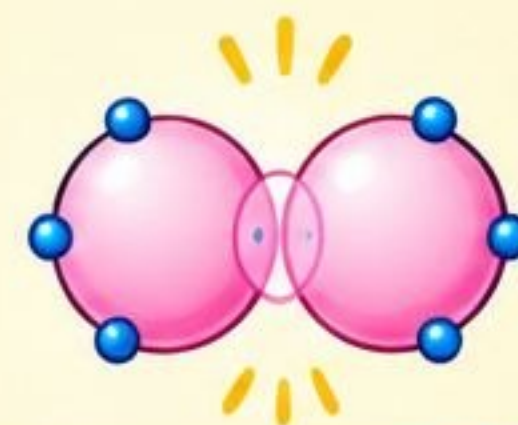
Kimyoviy bog'lanish
haqida tushuncha



2

Kovalent bog'lanish
va uning turlari

- Qutbsiz kovalent bog'lanish
- Qutbli kovalent bog'lanish



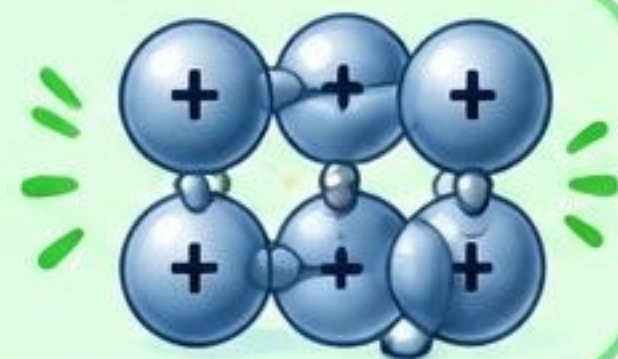
3

Ion bog'lanish



4

Metall bog'lanish



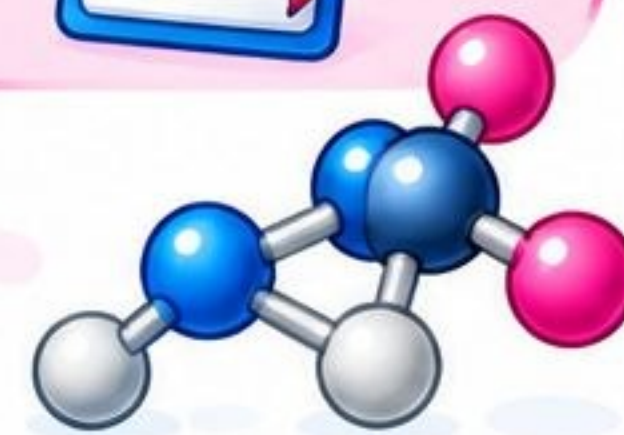
5

Kimyoviy bog'lanish
turlarini taqqoslash



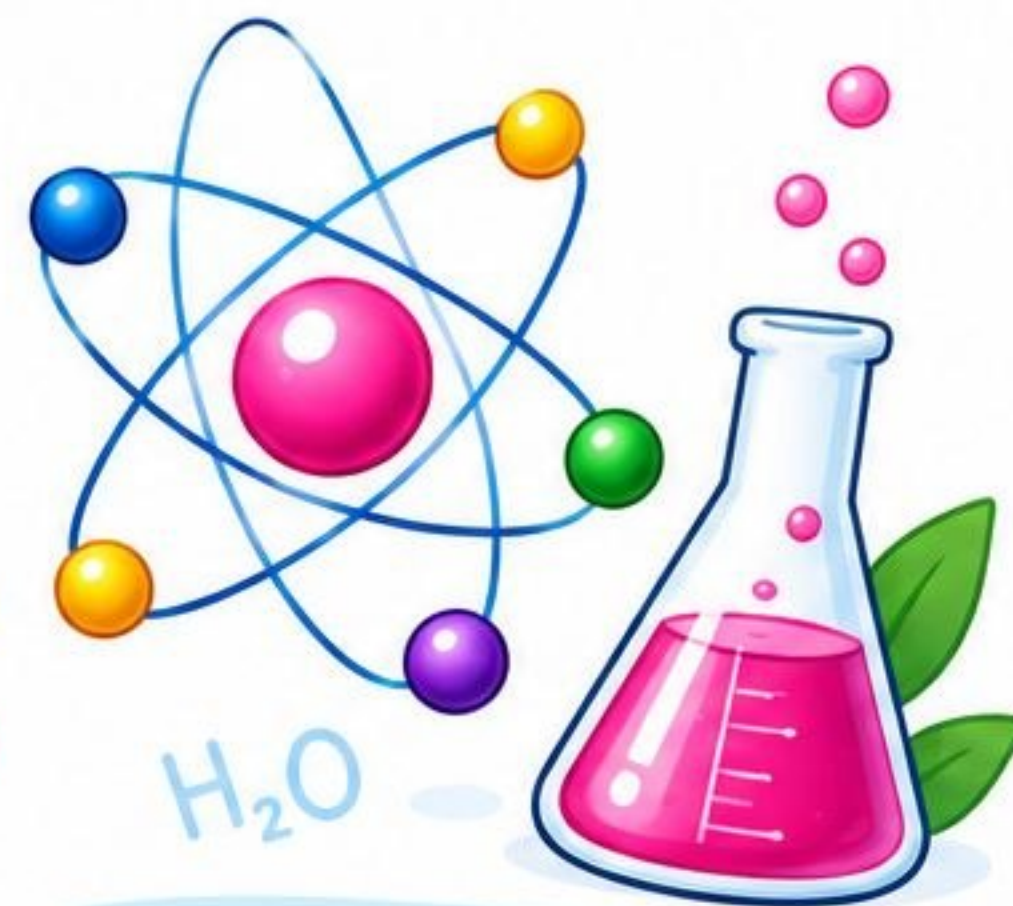
6

Mavzuni
mustahkamlash





DARSNING MAQSADI

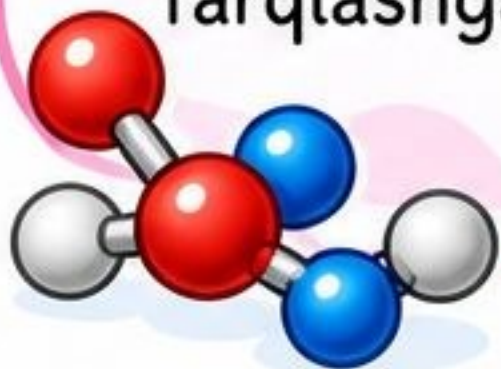


1

Ta'limiy maqsad



O'quvchilarda kimyoviy bog'lanish, uning **ion, kovalent va metall bog'lanish** turlari haqida bilim hosil qilish hamda ularni bir-biridan farqlashga o'rgatish.



2

Tarbiyaviy maqsad



O'quvchilarda **ilmiy dunyoqarash, hamkorlikda ishlash, o'zaro hurmat va mas'uliyat** tuyg'ularini shakllantirish.

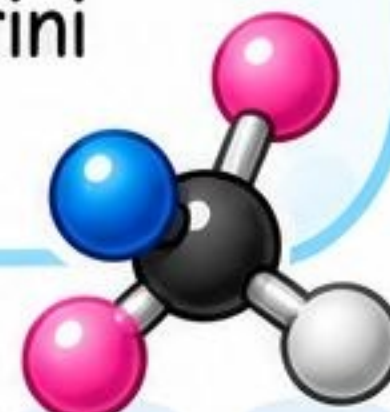


3

Rivojlantiruvchi maqsad



Kimyoviy bog'lanishlarni **taqqoslash, tahlil qilish, asoslash va xulosa chiqarish** orqali o'quvchilarning mantiqiy hamda mustaqil fikrlash ko'nikmalarini rivojlantirish.



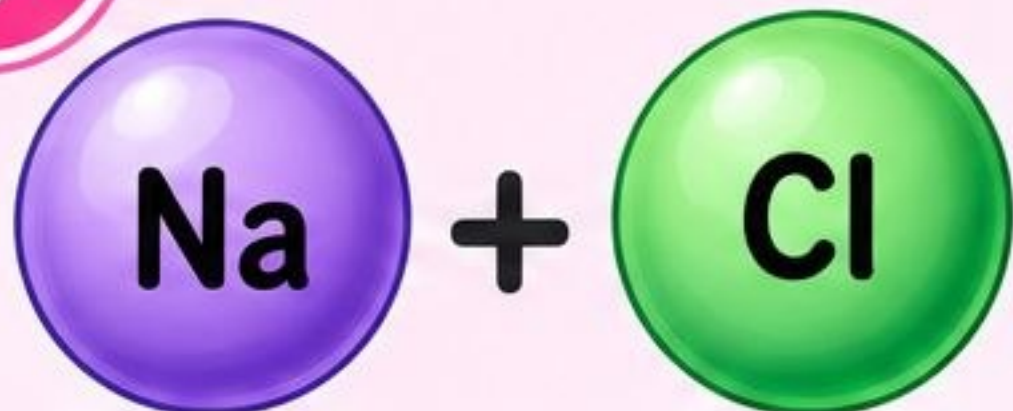
O'ylang
Taxmin qiling
Muhokama qiling



Ular qanday birlashadi-?

Atomlar
bir-biriga
yaqinlashganda
nima sodir
bo'ladi-?

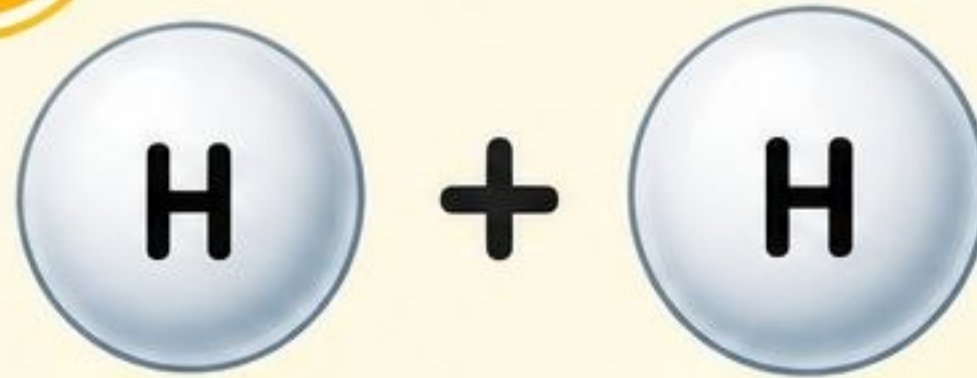
1



Natriy
atomi

Xlor
atomi

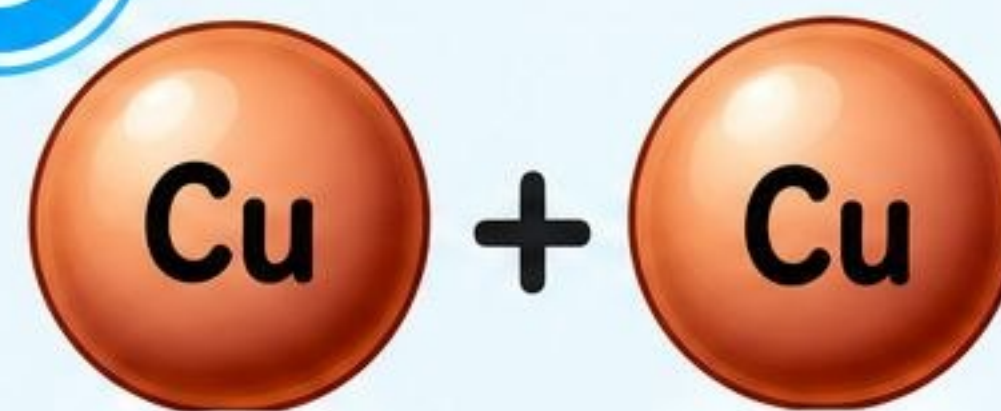
2



Vodorod
atomi

Vodorod
atomi

3



Mis
atomi

Mis
atomi

1

Bu atomlar birlashganda elektronlar bilan nima sodir bo'ladi-?

2

Elektron beriladimi, qabul qilinadimi yoki umumiy lashadimi-?

3

Uchala holatda bog'lanish bir xil bo'ladimi-?

O'z javobingizni
daftarga yozing.
Dars davomida
tekshiramiz. ♥

KIMYOVIIY BOG'LANISH

HAQIDA TUSHUNCHA

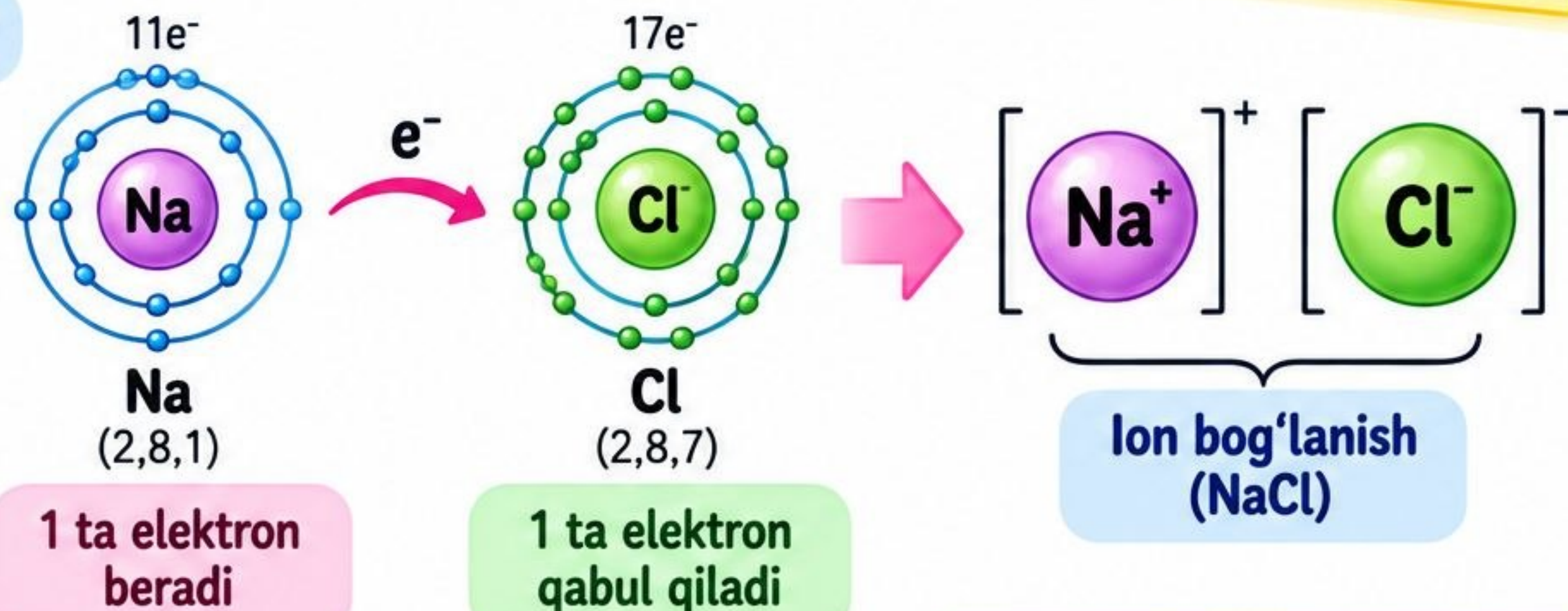


Kimyoviy bog'lanish – atomlar o'zaro ta'sirlashib, barqaror elektron konfiguratsiyaga erishishi natijasida hosil bo'ladigan kuchli tortishish kuchidir.

Atomlar
birikib,
yanada barqaror
bo'ladi. ❤️

Nima uchun atomlar birlashadi-?

- ✓ Barqaror elektron konfiguratsiyaga erishish uchun
- ✓ Energetik jihatdan qulay holatga o'tish uchun
- ✓ Tashqi qavatda 8 ta elektron (octet) yoki 2 ta elektron (duet)ga erishish uchun

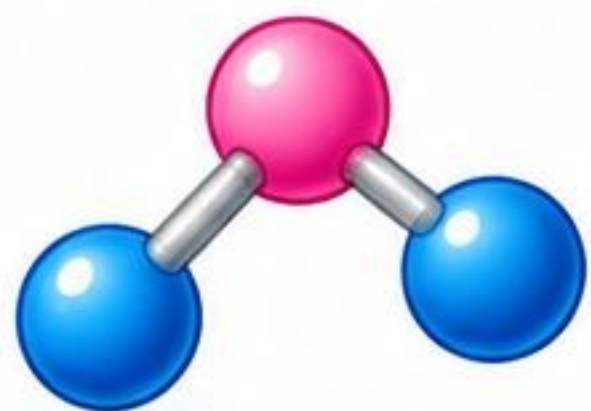


Natija: Kimyoviy bog'lanish natijasida atomlar birikadi va **yanada barqaror modda hosil bo'ladi.**



Eslab qoling:

- Kimyoviy bog'lanish – atomlar orasidagi tortishish kuchi.
- Ular modda hosil qiladi.



KOVALENT BOG'LANISH VA UNING TURLARI

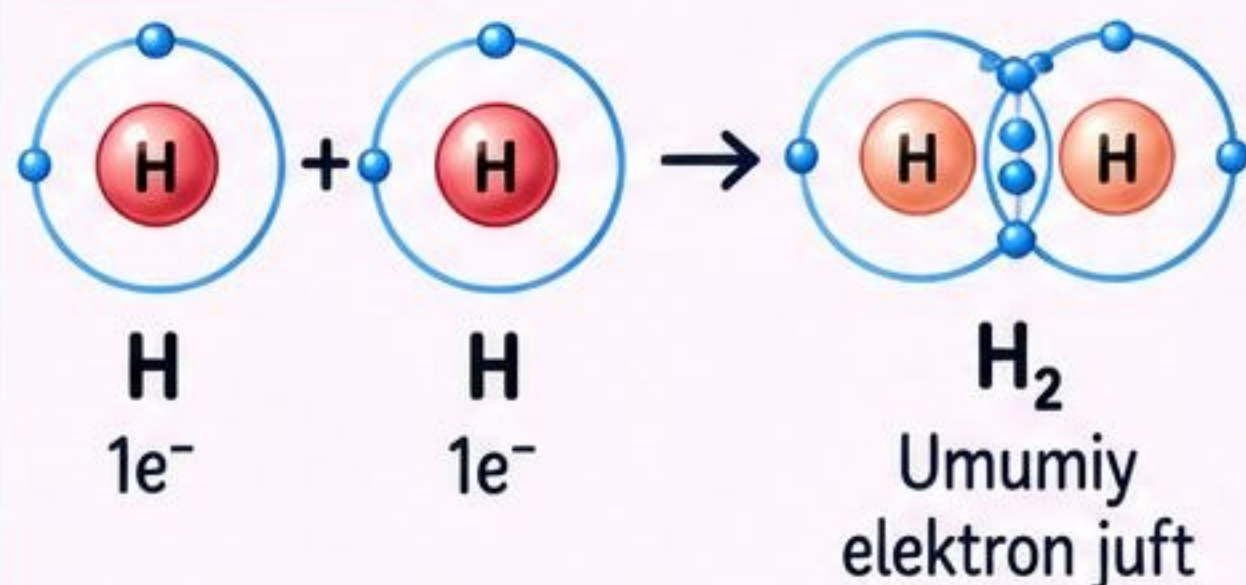
Umumiy
elektron juft
– barqaror
molekula! ♥

Kovalent bog'lanish – atomlar orasida umumiy elektron juft (yoki juftlar) hosil bo'lishi orqali vujudga keladigan kimyoviy bog'lanishdir.

Kovalent bog'lanish

- Atomlar o'zaro elektronlarni umumiyashtiradi.
- Asosan metallmas atomlar orasida hosil bo'ladi.
- Molekula hosil bo'ladi.

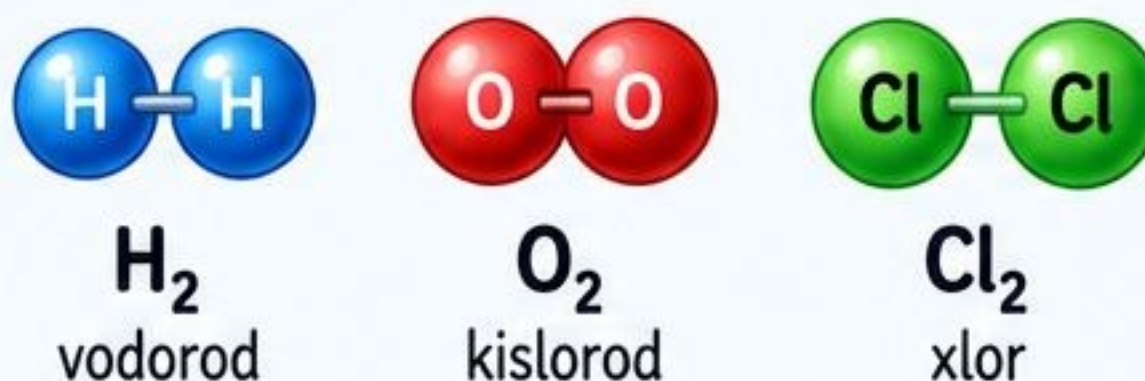
Misol: H_2



Qutbsiz kovalent bog'lanish

- Bir xil atomlar orasida hosil bo'ladi.
- Elektron juft teng taqsimlanadi.
- Molekula qutbsiz bo'ladi.

Misollar:

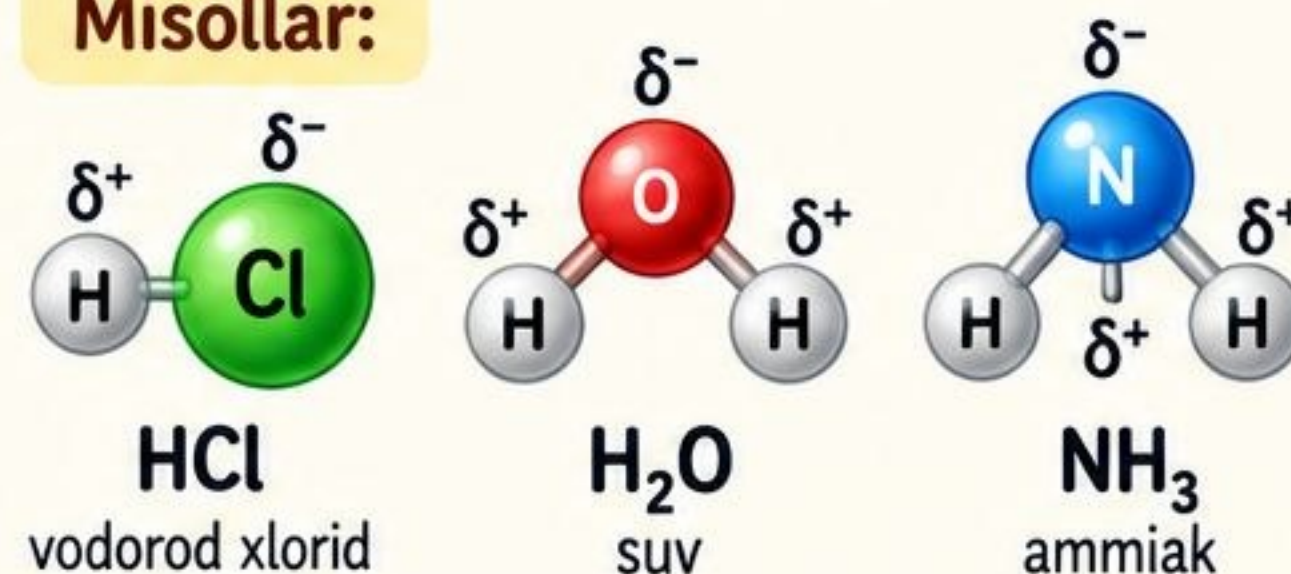


Elektronlar teng taqsimlangan
 $\rightarrow$ qutbsiz molekula

Qutbli kovalent bog'lanish

- Har xil atomlar orasida hosil bo'ladi.
- Elektron juft notekis taqsimlanadi.
- Molekula qutbli bo'ladi (δ^+ va δ^- zaryadlar paydo bo'ladi).

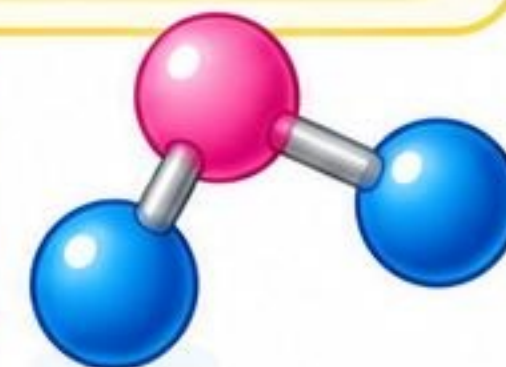
Misollar:



Elektronlar notekis taqsimlangan
 $\rightarrow$ qutbli molekula



Xulosa: Kovalent bog'lanish umumiy elektron juft hosil bo'lishi bilan tavsiflanadi va u qutbsiz yoki qutbli bo'lishi mumkin.



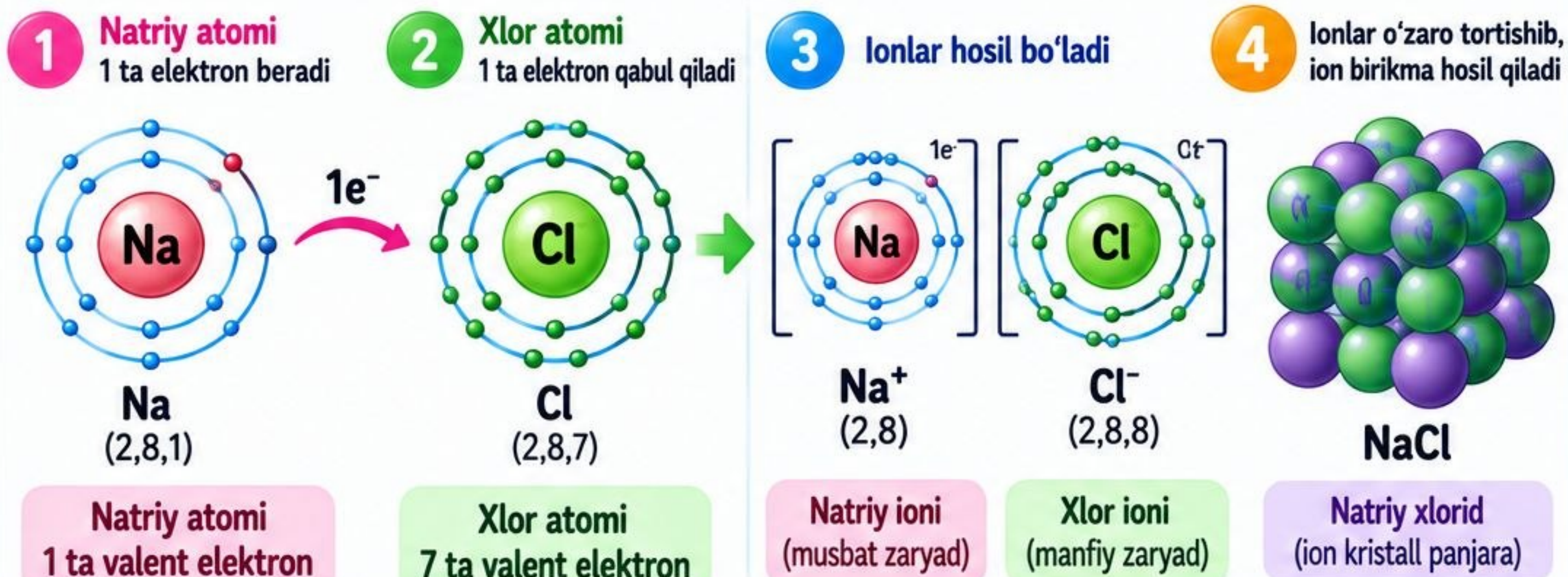
Elektron
beriladi,
qabul qilinadi,
barqarorlik
hosil bo'ladi!

ION BOG'LANISH

Natijada
musbat va
manfiy ionlar
orasida
tortishish kuchi
paydo bo'ladi!

Ion bog'lanish – metall va metallmas atomlar orasida elektronning to'liq berilishi va qabul qilinishi natijasida hosil bo'ladigan kimyoviy bog'lanishdir.

Ion bog'lanishning hosil bo'lishi (NaCl misolida)



Ion bog'lanishga xos xossalar

- ✓ Metall va metallmas atomlar orasida hosil bo'ladi.
- ✓ Qattiq, kristall modda hosil qiladi.
- ✓ Suyuqlanish va qaynash harorati yuqori.
- ✓ Qattiq holatda elektr tokini o'tkazmaydi, suyuqlanma yoki eritma holatda o'tkazadi.
- ✓ Odatda suvda yaxshi eriydi.
- ✓ Hosil bo'lgan moddalar mustahkam va barqaror bo'ladi.



Xulosa: Ion bog'lanish – elektronning to'liq berilishi va qabul qilinishi natijasida hosil bo'ladigan, musbat va manfiy ionlar o'rtasidagi **kuchli elektrostatik tortishish** bilan ta'minlangan bog'lanishdir.

Boshqa misollar:

MgO

magniy oksid

CaO

kalsiy oksid

KCl

kaliy xlorid

LiF

litiy fluorid

Metall atomlari
birgalikda
kuchlirog!

METALL BOG'LANISH

Erkin elektronlar
– metallarning
maxsus xususiyati!

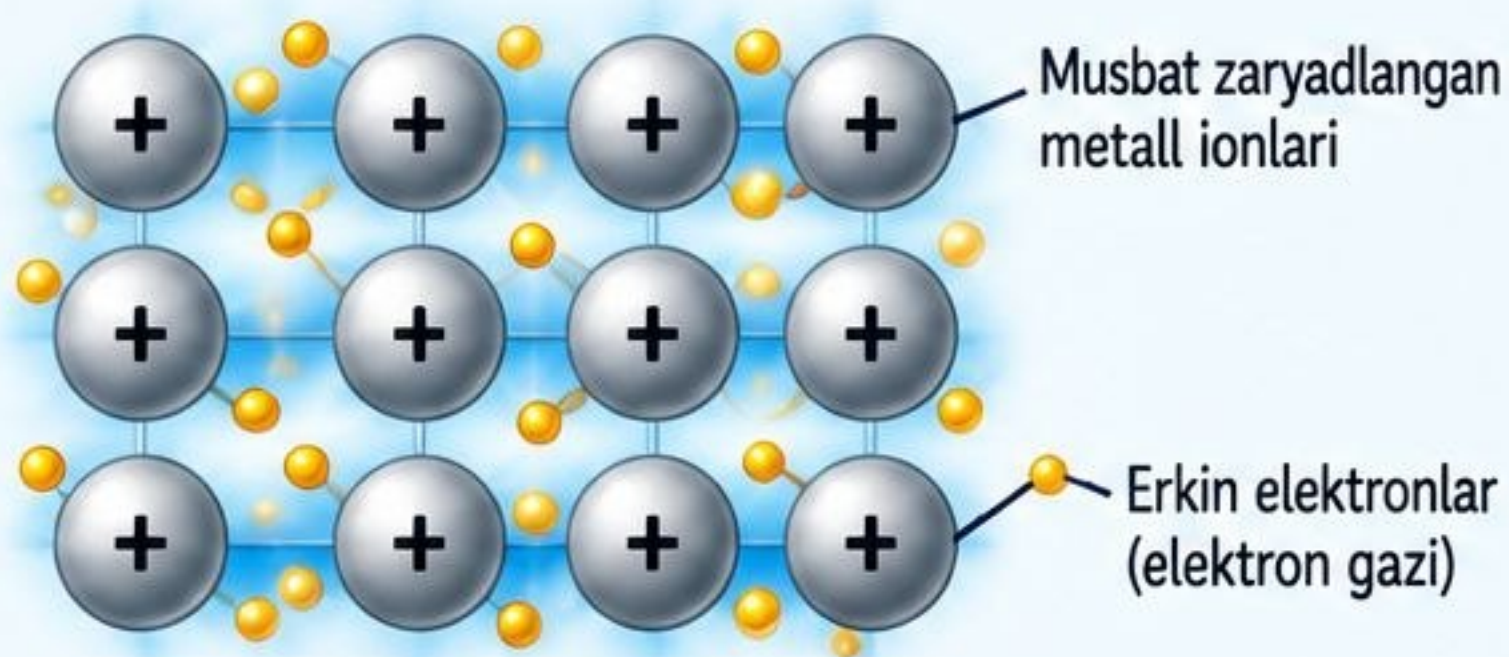
Metall bog'lanish – metall atomlari orasida erkin harakatlanadigan elektronlar (elektron gazi) va musbat zaryadlangan metall ionlari o'rtasidagi o'zaro tortishish kuchi natijasida hosil bo'ladigan kimyoviy bog'lanishdir.

Metall atomlarining tuzilishi



Metall atomlar tashqi qatlamda kam sonli valent elektronlarga ega va ularni oson beradi.

Metall bog'lanish modeli

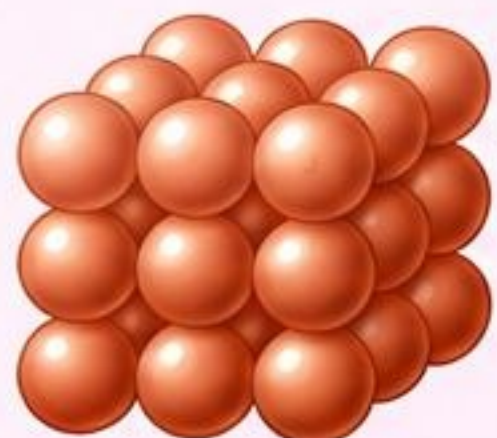


Metall atomlar elektronlarini umumiy elektron gaziga beradi, ular kristall panjara bo'ylab erkin harakatlanadi.

Metall bog'lanishning xossalari

- ✓ Metallarning o'ziga xos metall xossalarini taqminlaydi.
- ✓ Elektr va issiqlik tokini yaxshi o'tkazadi.
- ✓ Egiluvchan va cho'ziluvchan (plastik) bo'ladi.
- ✓ Metall yaltiroqligini ta'minlaydi.
- ✓ Ko'pincha qattiq, kristall holatda bo'ladi.
- ✓ Eritish va qaynash harorati yuqori.

Misol: Mis (Cu)



Mis atomlari elektronlarini umumiy elektron gaziga beradi. Shu sababli mis elektr tokini yaxshi o'tkazadi va egiluvchan bo'ladi.

Boshqa misollar:



Fe
temir



Al
alyuminiy



Cu
mis



Na
natriy



Xulosa:

Metall bog'lanish erkin elektronlar va musbat metall ionlari orasidagi kuchli tortishish kuchi tufayli hosil bo'ladi.

Kichik,
biroq muhim
bog'lanish!

VODOROD BOG'LANISH

Vodorod
bog'lanish
tabiatda
hayot manbai!

Vodorod bog'lanish – vodorod atomining yuqori elektrmanfiylikka ega bo'lgan F, O yoki N atomiga kovalent bog'langan va boshqa molekuladagi F, O yoki N atomining erkin elektron jufti bilan o'zaro tortishishi natijasida hosil bo'ladigan bog'lanishdir.

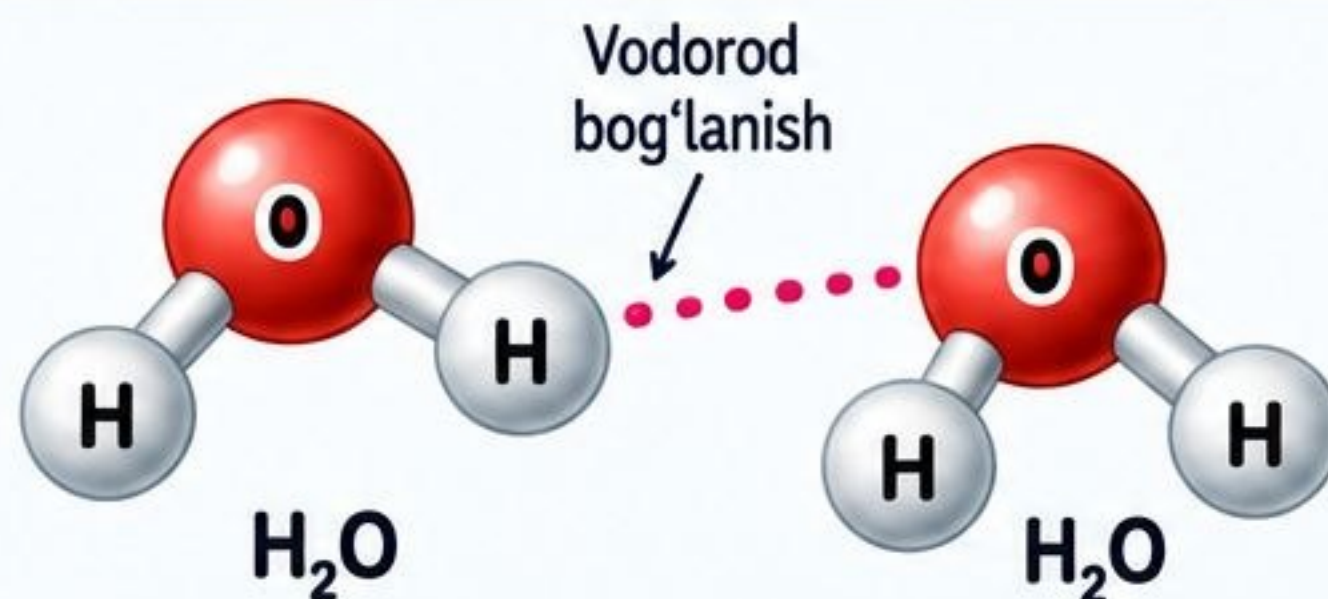
Qayerda hosil bo'ladi?

Vodorod bog'lanish, vodorod atomining F, O yoki N atomiga bog'langan molekulalar orasida hosil bo'laadi.



Yuqori elektrmanfiylikka
ega atomlar

Vodorod bog'lanishning modeli



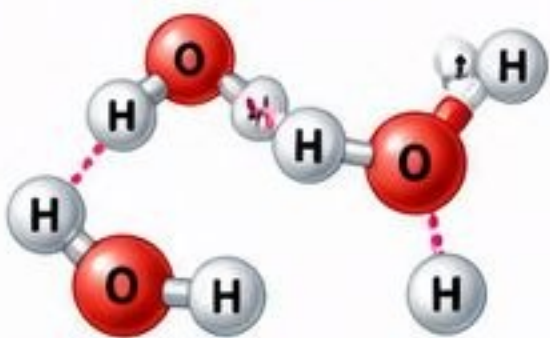
Nuqtali chiziq (....) vodorod bog'lanishni ifodalaydi.

Vodorod bog'lanishning xossalari

- ✓ Molekulalar orasida hosil bo'ladi (intermolekulyar bog'lanish).
- ✓ Kovalent va ion bog'lanishdan zaifroq, lekin muhim ahamiyatga ega.
- ✓ Moddalarning qaynash va erish haroratini oshiradi.
- ✓ Suyuqlarning sirt tarangligini kuchaytiradi.
- ✓ Moddalarning eruvchanligiga ta'sir qiladi.

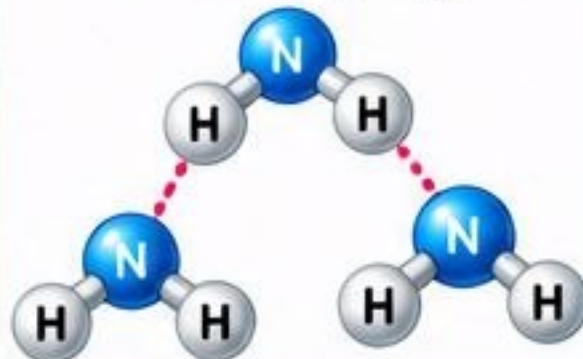
Misollar

Suv (H_2O)



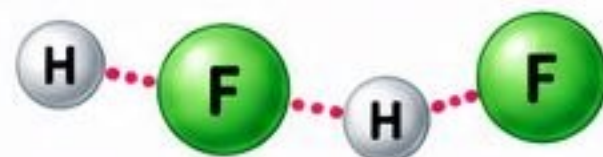
Suv molekulalari orasida vodorod bog'lanish hosil bo'ladi.

Ammiak (NH_3)



Ammiak molekulalari orasida vodorod bog'lanish mavjud.

Ftorid vodorod (HF)



HF molekulalari orasida vodorod bog'lanish hosil bo'ladi.

Vodorod bog'lanishning hayotdagi ahamiyati



- Suvning yuqori qaynash harorati
- Muzning kam zichligi
- DNK tuzilmasining barqarorligi
- Oqsillar tuzilmasining saqlanishi
- O'simliklarda suvning harakati



Xulosa:

Vodorod bog'lanish – F, O yoki N atomiga bog'langan vodorod va boshqa molekuladagi F, O yoki N atomlar orasidagi tortishish kuchi tufayli hosil bo'ladigan muhim bog'lanishdir.

DONOR-AKSEPTOR BOG'LANISH

Elektron juftini hadya qilish – yangi bog'lanish boshlanishi!

Donor-akseptor bog'lanish – bir atomning yolg'iz elektron juftini boshqa atomning bo'sh orbitaliga berishi natijasida hosil bo'ladigan kovalent bog'lanishdir.

Donor elektron juftini beradi, akseptor esa qabul qiladi.

Donor va akseptor

Donor

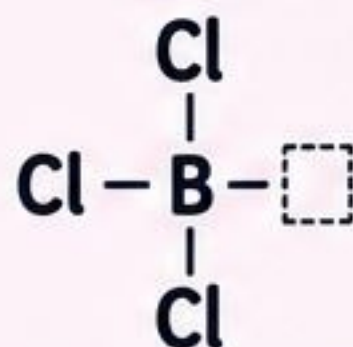
Yolg'iz elektron juftiga ega atom (yoki ion).



Elektron juftini beradi

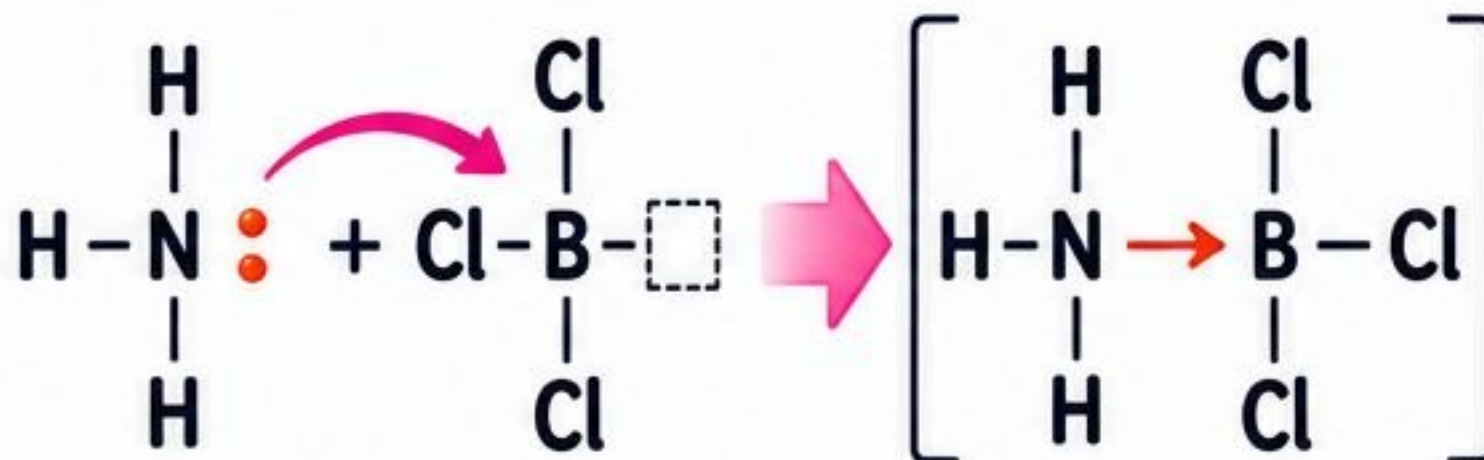
Akseptor

Bo'sh orbitalga ega atom (yoki ion).



Elektron juftini qabul qiladi

Bog'lanishning hosil bo'lishi



Donor
(NH_3)

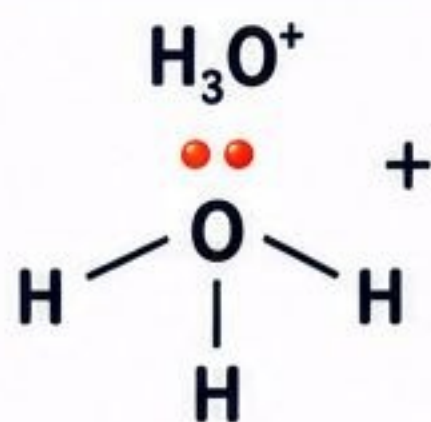
Akseptor
(BCl_3)

Donor-akseptor bog'lanish
($\text{NH}_3 \rightarrow \text{BCl}_3$)

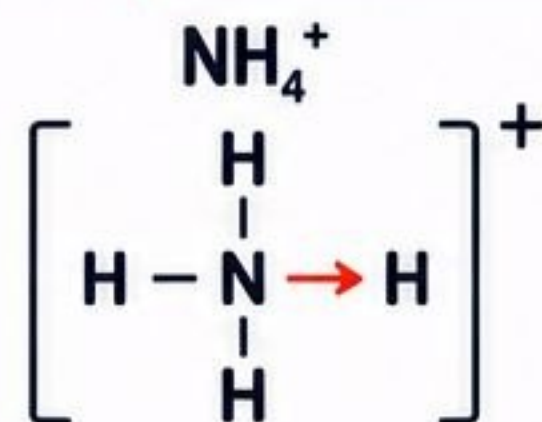
Xususiyatlari

- ✓ Kovalent bog'lanish turiga kiradi.
- ✓ Donor atom yolg'iz elektron juftini beradi.
- ✓ Akseptor atom bo'sh orbitalga ega bo'ladi.
- ✓ Hosil bo'lgan bog'lanishda elektron jufti donor atomdan keladi.
- ✓ Ko'pincha molekula yoki ion hosil bo'ladi.

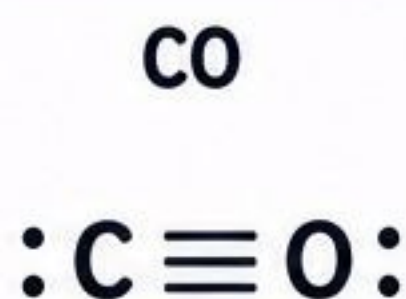
Boshqa misollar



Suv molekulasida elektron juftini H^+ ga beradi.



Ammiak elektron juftini H^+ ga beradi.



Uglerod kislorodga elektron juftini beradi.



Xulosa:

Donor-akseptor bog'lanish – donor atomning yolg'iz elektron juftini akseptor atomning bo'sh orbitaliga berishi natijasida hosil bo'ladigan kovalent bog'lanishdir.

Turli atomlar
– turli bog‘lanish
– turli moddalar!

Kimyoviy bog‘lanish turlarini taqqoslash

Bog‘lanishni
tushun –
moddalarni angla!

Bog‘lanish turi	Ion bog‘lanish	Kovalent bog‘lanish	Metall bog‘lanish	Vodorod bog‘lanish	Donor–akseptor bog‘lanish (koordinatsion kovalent)
Qisqacha tavsif-?	Qarama-qarshi zaryadlangan ionlar orasidagi elektrostatik tortishish natijasida hosil bo‘ladigan bog‘lanish.	Atomlar o‘rtasida umumiy elektron juft(lar) hisobiga hosil bo‘ladigan bog‘lanish.	Metall atomlarining erkin elektronlari va musbat zaryadlangan metall ionlari o‘rtasidagi tortishish natijasida hosil bo‘ladigan bog‘lanish.	H atomining kuchli elektrmanfiy atom (F, O yoki N) bilan bog‘lanishi va boshqa molekula yoki molekulaning o‘zida shu atomning yolg‘iz elektron jufti bilan tortishishi natijasida hosil bo‘ladigan bog‘lanish.	Bir atomning yolg‘iz elektron juftini boshqa atomning bo‘sh orbitaliga berishi natijasida hosil bo‘ladigan (kovalent) bog‘lanish.
Qanday hosil bo‘ladi-?	Bir atom elektron(lar)ni beradi, boshqa atom qabul qiladi. Natijada kation va anionlar hosil bo‘lib, ular o‘zaro tortishadi.	Atomlar o‘z valent elektronlarini umumiy lashtirib, umumiy elektron juft(lar) hosil qiladi.	Metall atomlari o‘z valent elektronlarini umumiy elektron gaziga beradi.	F, O yoki N ga bog‘langan H atomining qisman musbat zaryadi ($\delta+$) va boshqa molekuladagi F, O yoki N ning yolg‘iz elektron jufti o‘rtasidagi tortishish natijasida hosil bo‘ladi.	Donor atom (yolg‘iz elektron juftiga ega) elektron juftini beradi, akseptor atom (bo‘sh orbitalga ega) qabul qiladi.
Kimlar orasida hosil bo‘ladi-?	Asosan metall va metallmas atomlar orasida.	Asosan metallmas atomlar orasida (bir xil yoki turli metallmas atomlar).	Metall atomlari orasida.	F, O yoki N ga bog‘langan H atomli molekular orasida yoki bir molekula ichida.	Yolg‘iz elektron juftiga ega atom (donor) va bo‘sh orbitalga ega atom (akseptor) orasida.
Misol-?	NaCl	H ₂ , O ₂ , H ₂ O, CO ₂	Fe, Cu, Al	H ₂ O ... H ₂ O, HF ... HF	$\text{NH}_3 + \text{H}^+ \rightarrow \text{NH}_4^+$ $[\text{Cu}(\text{NH}_3)_4]^{2+}$
Chizma (model)-?					
Asosiy xossalari-?	- Qattiq, kristall modda - Eriish va qaynash harorati yuqori - Suvda yaxshi eriydi - Elektr tokini faqat suyuq holatda yoki eritmada o‘tkazadi	- Molekulyar modda - Eriish va qaynash harorati nisbatan past - Suvda yomon eriydi (ba‘zilari eriydi) - Elektr tokini o‘tkazmaydi	- Yaxshi elektr va issiqlik o‘tkazuvchan - Egiluvchan va cho‘ziluvchan - Metall yaltiroqligiga ega - Ko‘pincha qattiq holatda bo‘ladi (simob – suyuq)	- Nisbatan kuchsiz bog‘lanish - Molekulararo va molekula ichida ham hosil bo‘ladi - Moddalarning erish va qaynash haroratini oshiradi - Suvda eruvchanlikni oshiradi	- Kovalent bog‘lanish turiga kiradi - Umumiy elektron juftning ikkala elektroni donor atomdan keladi - Ko‘pincha kompleks birikmalarda uchraydi - Barqaror birikmalar hosil qiladi

Topshiriq:

Quyidagi moddalar uchun savollarga javob bering.



MUSTAXKAMLASH BOG'LANISH DETEKTIVI

O'ylang
Tahlil qiling
Javob bering-?

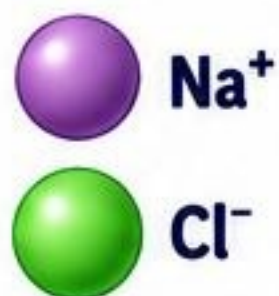
1 Bog'lanish turini aniqlang-?

2 Elektron beriladimi, qabul qilinadimi
yoki umumiy lashadimi-?

3 Javobingizni bitta belgi yoki
xossa bilan asoslang-?

1

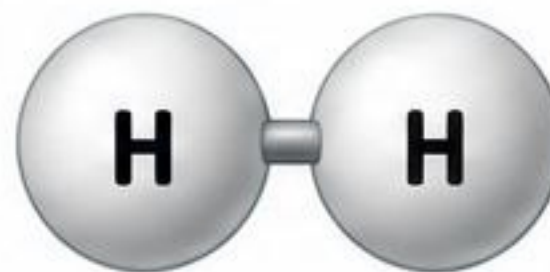
NaCl



- 1 Bog'lanish turi - ? _____
2 Elektron jarayoni - ? _____
3 Asoslang (belgi/xossa) - ? _____

2

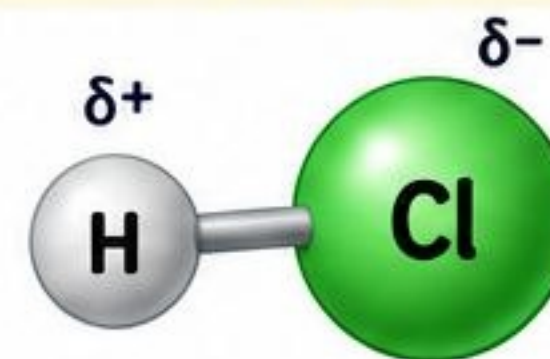
H₂



- 1 Bog'lanish turi - ? _____
2 Elektron jarayoni - ? _____
3 Asoslang (belgi/xossa) - ? _____

3

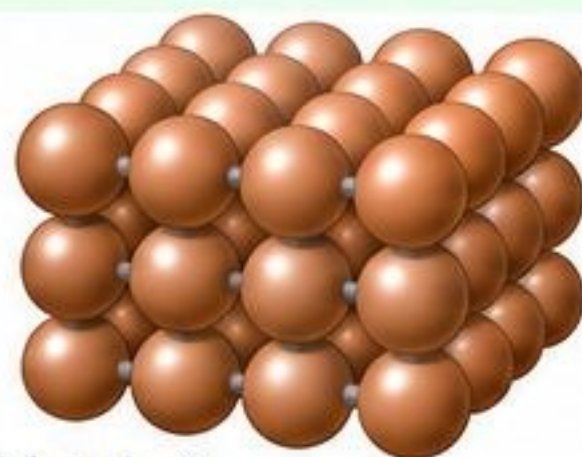
HCl



- 1 Bog'lanish turi - ? _____
2 Elektron jarayoni - ? _____
3 Asoslang (belgi/xossa) - ? _____

4

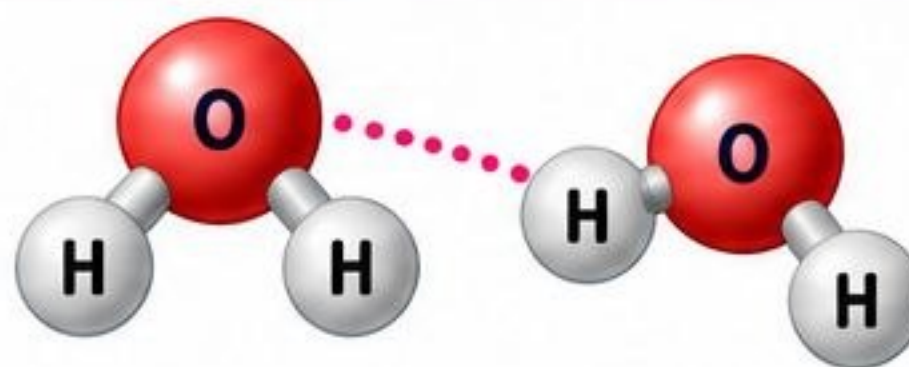
Cu



- 1 Bog'lanish turi - ? _____
2 Elektron jarayoni - ? _____
3 Asoslang (belgi/xossa) - ? _____

5

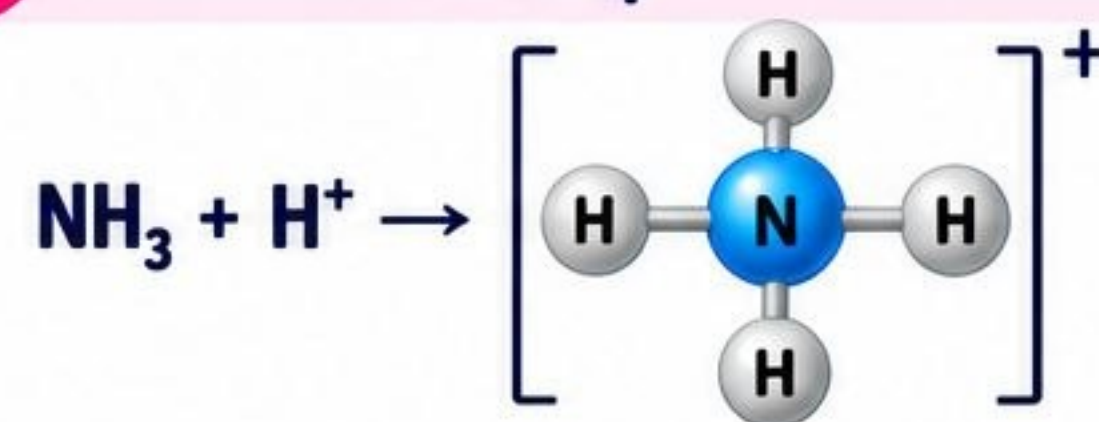
H₂O ... H₂O



- 1 Bog'lanish turi - ? _____
2 Elektron jarayoni - ? _____
3 Asoslang (belgi/xossa) - ? _____

6

NH₄⁺



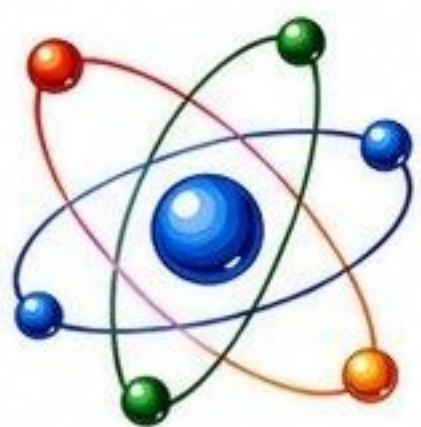
- 1 Bog'lanish turi - ? _____
2 Elektron jarayoni - ? _____
3 Asoslang (belgi/xossa) - ? _____



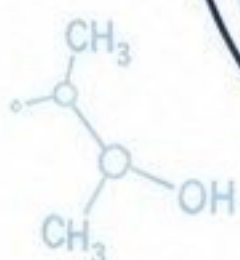
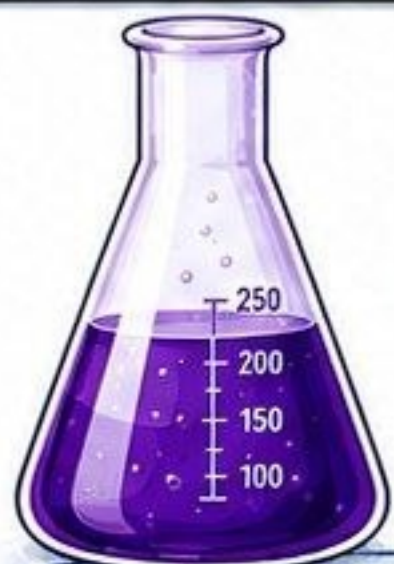
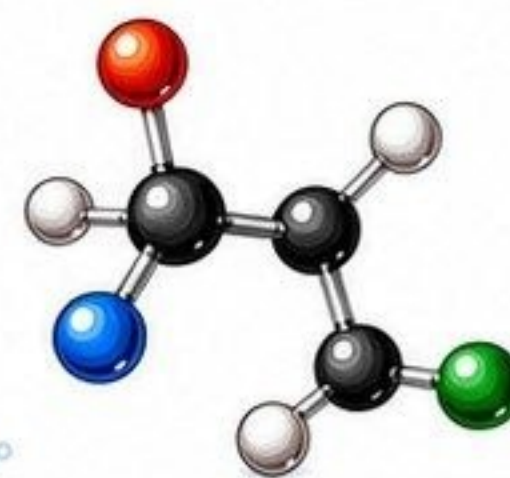
Qo'shimcha topshiriq: Ushbu moddalardan qaysilari molekula, qaysilari kristall panjara hosil qiladi-?



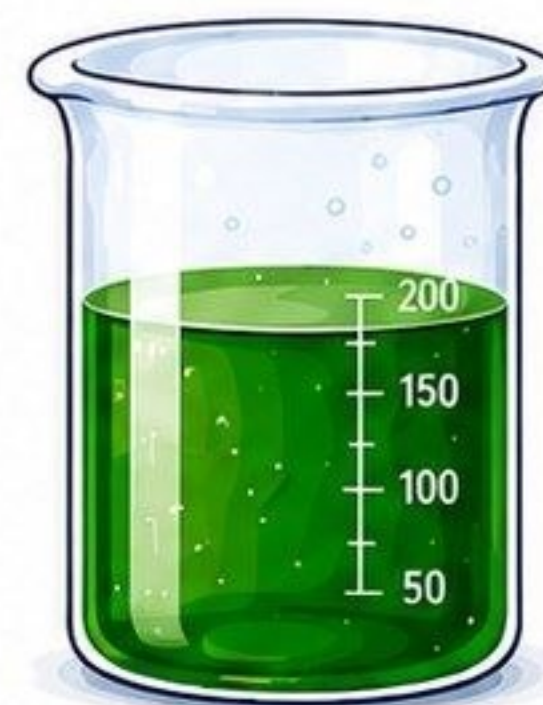
Qaysi modda(lar)da bir nechta bog'lanish turi mavjud-?



QUTBLI, QUTBSIZ VA ION BOG'LANISHLI MODDALARNI AJRATING!



H_2O , CO_2 , NH_3 , CH_3Cl , HCl , H_2S , SO_2 , CCl_4 , CH_4 , NH_4Cl ,
 $NaCl$, H_2SO_4 , CH_3OH , C_2H_6 , O_2 , N_2 , HBr , HI , CO , SiO_2 ,
 $CaCl_2$, K_2SO_4 , MgO , HCN , CH_3COOH , BF_3 , C_2H_4 , C_6H_6 ,
 PCl_3 , HNO_3 , H_2 , Cl_2 , H_2CO_3 , $NaOH$, H_3PO_4 , C_2H_2 , CS_2 ,
 KOH , CaO , CH_3NH_2 , SO_3 , P_2O_5 , CH_3CH_2OH , C_3H_8



1

QUTBLI MODDALAR

- | | |
|-----------|-----------|
| 1. _____ | 11. _____ |
| 2. _____ | 12. _____ |
| 3. _____ | 13. _____ |
| 4. _____ | 14. _____ |
| 5. _____ | 15. _____ |
| 6. _____ | 16. _____ |
| 7. _____ | 17. _____ |
| 8. _____ | 18. _____ |
| 10. _____ | 20. _____ |

2

QUTBSIZ MODDALAR

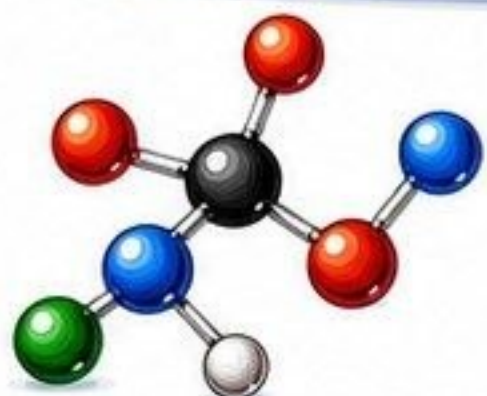
- | | |
|-----------|-----------|
| 1. _____ | 11. _____ |
| 2. _____ | 12. _____ |
| 3. _____ | 13. _____ |
| 4. _____ | 14. _____ |
| 5. _____ | 15. _____ |
| 6. _____ | 16. _____ |
| 7. _____ | 17. _____ |
| 8. _____ | 18. _____ |
| 10. _____ | 20. _____ |

3

ION BOG'LANISHLI MODDALAR

- | | |
|-----------|-----------|
| 1. _____ | 11. _____ |
| 2. _____ | 12. _____ |
| 3. _____ | 13. _____ |
| 4. _____ | 14. _____ |
| 5. _____ | 15. _____ |
| 6. _____ | 16. _____ |
| 7. _____ | 17. _____ |
| 8. _____ | 18. _____ |
| 10. _____ | 20. _____ |

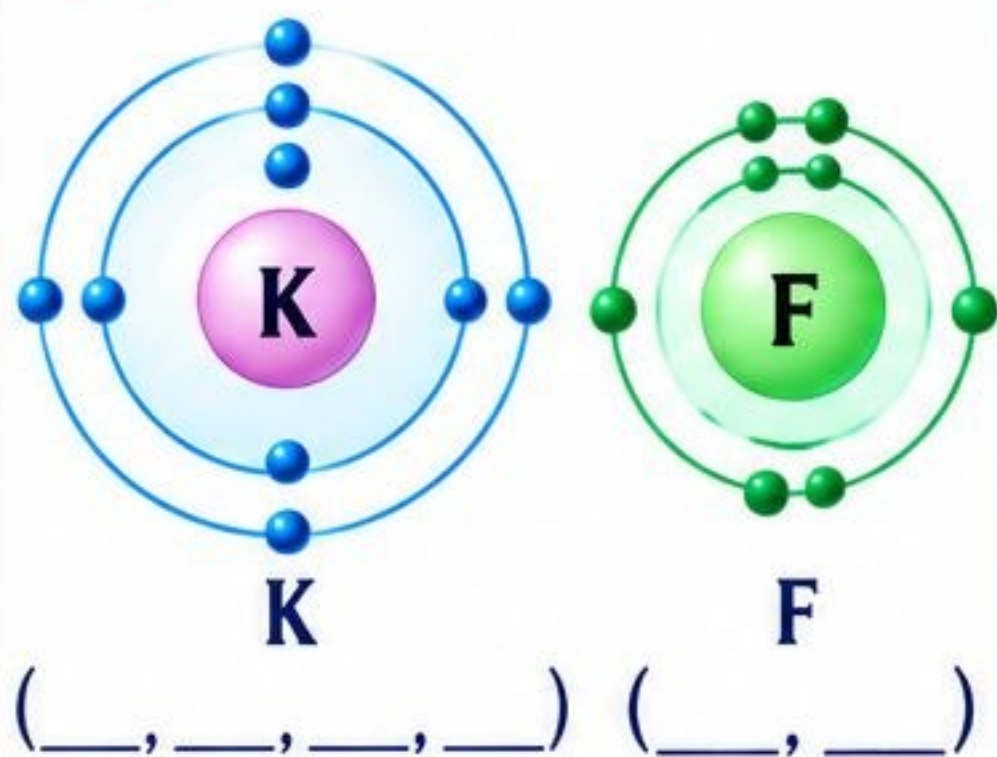
XULOSA:



KF molekulasining hosil bo'lishi

1

Boshlang'ich holat

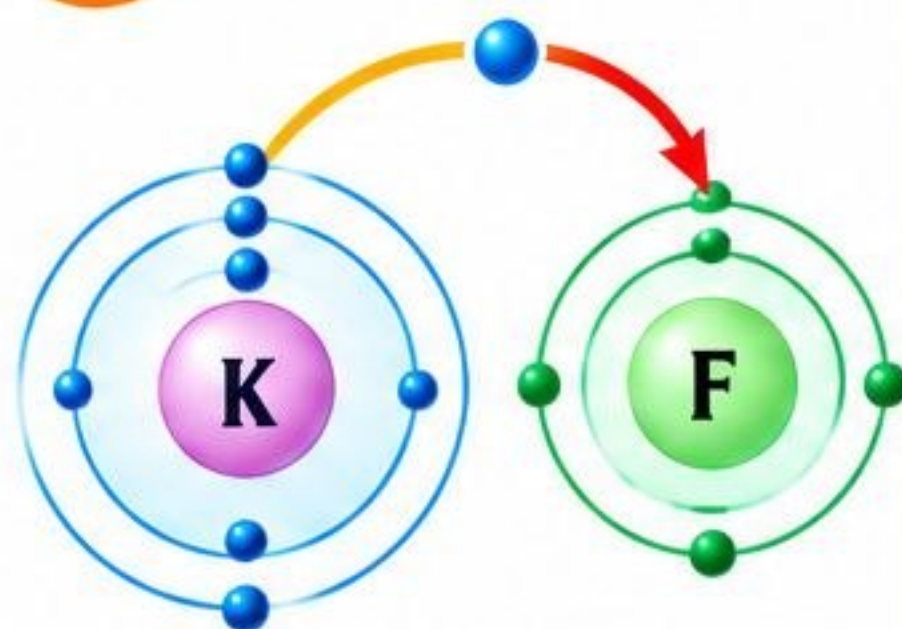


K atomining
tashqi qavatida
____ ta
elektron bor.

F atomining
tashqi qavatida
____ ta
elektron bor.

2

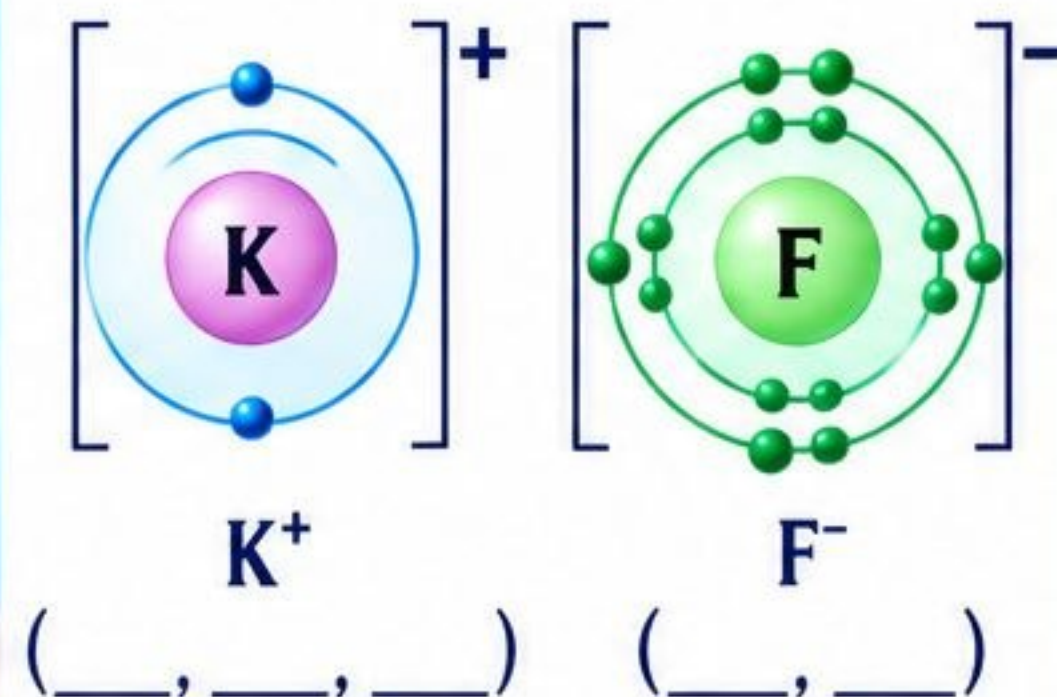
Elektron o'tishi



K atomidan F atomiga
____ ta elektron
_____.

3

Hosil bo'lgan ionlar

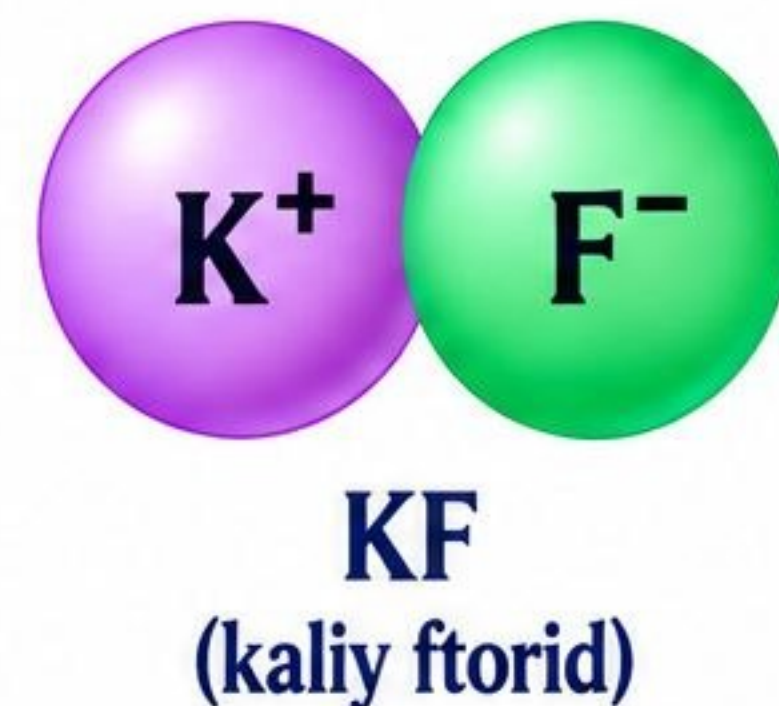


K qanday
ionga aylandi-?

F^- qanday
ionga aylandi-?

4

Natijiy modda



K^+ va F^- ionlari
orasida _____
bog' hosil bo'ladi.

Xulosa

KF da _____ bog' mavjud.
U _____ birikmalar turiga kiradi.

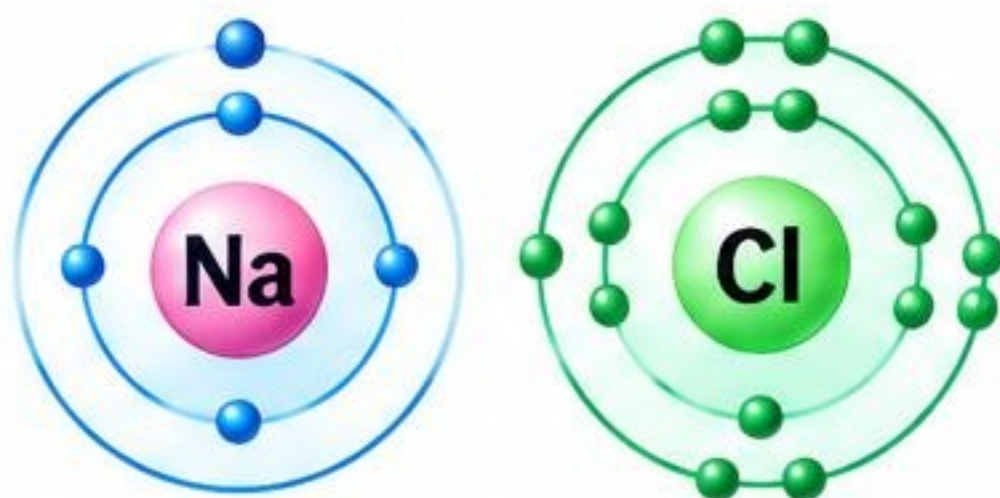
KF ning xossalari

- _____
- _____
- _____

NaCl molekulasining hosil bo'lishi

1

Boshlang'ich holat



Na
(2,8,1)

Cl
(2,8,7)

Na atomida

Cl atomida

2

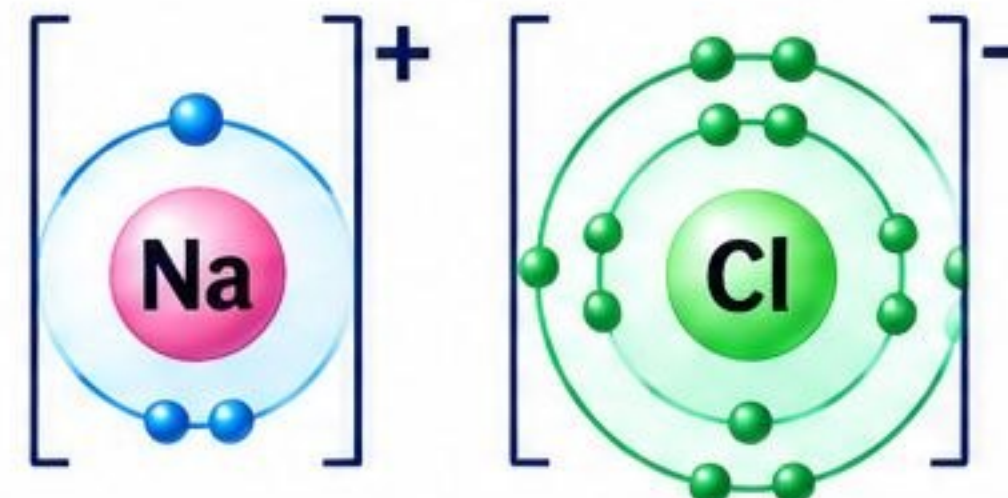
Elektron o'tishi



Na atomidan Cl atomiga
1 ta elektron _____.

3

Hosil bo'lgan ionlar

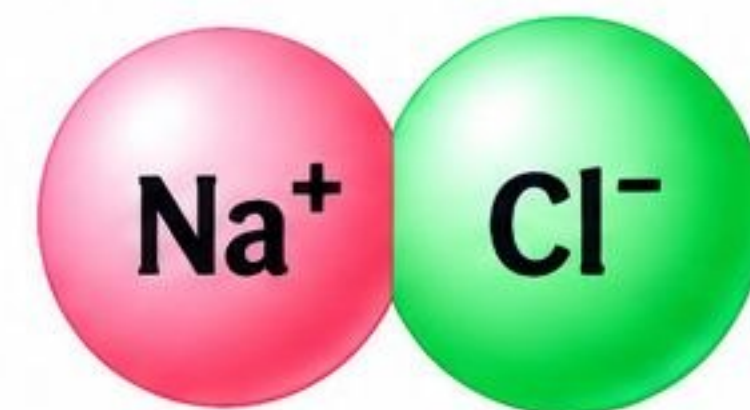


Na⁺ ioni
(2,8)

Cl⁻ ioni
(2,8,8)

4

Natijiy modda



NaCl
(natriy xlorid)

Na va Cl ionlari
o'rtasida _____
bog' hosil bo'ladi.

Xulosa

NaCl da _____ bog' mavjud.

NaCl ning xossalari

- _____
- _____
- _____

Mavzu: Kimyoviy bog'lanish turlari

No	Fikr	To'g'ri	Noto'g'ri
1	Vodorod molekulasida qutbsiz kovalent bog' mavjud.	☐	☐
2	MgCl ₂ tarkibida ion bog' mavjud.	☐	☐
3	N ₂ molekulasida bitta σ va ikkita π -bog' mavjud.	☐	☐
4	N ₂ molekulasidagi bog' qutbli kovalent bog' hisoblanadi.	☐	☐
5	Na[Al(OH) ₄] tarkibida ion bog' mavjud.	☐	☐
6	NH ₄ ⁺ ionida donor-akseptor mexanizmi orqali hosil bo'lgan bog' mavjud.	☐	☐
7	NH ₄ NO ₃ tarkibida ion va kovalent bog'lar mavjud.	☐	☐
8	Umumiy elektron juft hosil bo'lishi kovalent bog'lanishga xos.	☐	☐



TOPSHIRIQ:

Ion bog'lanish va qutbli kovalent bog'lanishning o'xshash va farqli tomonlarini Ven diagrammasiga yozing.

VEN DIAGRAMMASI

Ikki bog'lanishni taqqoslaymiz!



ESDA TUTING!

Har bir qismga mos ma'lumotlarni o'z fikringiz asosida yozing.

ION BOG'LANISH

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

O'XSHASH TOMONLARI

- _____
- _____
- _____
- _____
- _____
- _____
- _____

QUTBLI KOVALENT BOG'LANISH

- _____
- _____
- _____
- _____
- _____
- _____
- _____