

**O'ZBEKISTON RESPUBLIKASI OLIY VA O'RTA MAXSUS TA'LIM
VAZIRLIGI**



NIZOMIY NOMIDAGI TOSHKENT DAVLAT PEDAGOGIKA UNIVERSITETI



TABIIYOT FANLARI FAKULTETI

“KIMYO VA UNI O'QITISH METODIKASI” kafedrası

5140300 – “Kimyo” yo'nalishi 2-kurs 201-guruh talabasi

Boymurodova Mahzunaning “Noorganik kimyo” fanidan

“ Tuzlar. Tuzlarning guruhlanishi: o'rta, asosli, nordon, qo'sh aralash va kompleks tuzlar” mavzusidagi

KURS ISHI

Ilmiy rahbar: D.Usmonova.

Ilmiy darajasi va lavozimi:

**“Kimyo va uni o'qitish metodikasi
kafedrası katta o'qituvchisi.**

Toshkent -2014 y

Mavzu: Tuzlar.Tuzlarning guruhlanishi:o'rta, asosli , nordon , qo'sh aralash va kompleks tuzlar

Reja:

Kirish

Kurs ishini dolzarbligi, maqsadi, vazifalari.

Asosiy qism

1. Tuzlar haqida qisqacha ma'lumot.
2. O'rta (normal) tuzlar nomenklaturasi va olinishi.
3. Nordon tuzlar nomenklaturasi va olinishi.
4. Asosli tuzlar nomenklaturasi va olinishi.
5. Qo'sh tuzlar nomenklaturasi va olinishi.
6. Kompleks tuzlar. Tuzlarning umumiy xossalari.

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Xulosa

Foydalanilgan adabiyotlar.

Kirish.

1997 yil 29 avgustda “Ta’lim to’g’risida”gi Qonun va “Kadrlar tayyorlash milliy dasturi” qabul qilingandan so’ng respublikamiz butun ta’lim tizimi, jumladan, bakalavriat va magistrlar tayyorlash yo’nalishini ham tubdan isloh qilishning aniq strategik dasturiga ega bo’ldi. Ana shu tarixiy hujjat qatorida Kadrlar tayyorlash milliy dasturining amaliy ijrosiga, shuningdek, bakalavr va magistrlar tayyorlashga bag’ishlangan O’zbekiston Prezidentining o’ndan ortiq Farmon va farmoyishlari, O’zbekiston Respublikasi Vazirlar Mahkamasining qarorlari qabul qilindi. Xususan, 2004 yil 19 fevralda O’zbekiston Respublikasi Prezidentining “2004-2008 yillarda Maktab ta’limini rivojlantirish dasturini tayyorlash chora-tadbirlari to’g’risida”gi farmoyishi, 2004 yil 21 mayda “2004-2009 yillarda maktab ta’limini rivojlantirishning davlat umummilliy dasturi to’g’risida”gi Farmonlarning qabul qilinishi ta’lim rivoji millat, xalq taqdiriga, yangi yosh avlodning kelajagiga, iqtidoriga daxldor ekanini ko’zda tutadi.

Kadrlar tayyorlash milliy dasturi va Maktab ta’limini rivojlantirish Davlat umummilliy dasturining ijrosi amalda nihoyasiga yetkazildi. 9 yillik umum ta’lim maktab bosqichini va 3 yillik o’rta maxsus, kasb-hunar ta’limi bosqichini o’z ichiga olgan uzluksiz yaxlit ta’lim tizimi yaratildi. Bir so’z bilan aytganda, farzandlarimizga umumiy ta’lim bilan birga, zamonaviy kasb-hunarga ega bo’lish imkonini beradigan 12 yillik ta’lim tizimiga o’tish yakunlanmoqda.

Mazkur huquqiy hujjatlarda birinchidan, yangi ta’lim tizimi, ikkinchidan, yangi avlod kadrlarini tayyorlashda ta’lim sohasidagi o’zgarishlar, yangi kasb sohalarining paydo bo’lganligi va uning O’zbekiston sharoiti, ahamiyatligi bilan bog’liq jihatlari, uchinchidan, bunda har bir viloyat, hudud va mintaq xususiyatlarini hisobga olish tajribasining afzalliklari, to’rtinchidan, mamlakatimiz oliy ta’lim sohasidagi 71 ta muassasa tayyorlab beradigan yangi avlod kadrlari, ularning umumiy va o’ziga xos jihatlarga e’tibor qaratildi.

«Barkamol avlod yili» davlat dasturining maqsadi:

Mamlakatimizda sog’lom va barkamol avlodni tarbiyalash, yoshlarning o’z ijodiy va intellektual salohiyatini ro’yobga chiqarishi, mamlakatimiz yigit-qizlarini XXI asr

talablariga to'liq javob beradigan har tomonlama rivojlangan shaxslar etib voyaga yetkazish uchun zarur shart-sharoitlar va imkoniyatlarni yaratish bo'yicha keng ko'lamli aniq yo'naltirilgan chora-tadbirlarni amalga oshirishga qaratildi.

Ta'lim O'zbekiston Respublikasi ijtimoiy taraqqiyot sohasida ustuvor deb e'lon qilinadi.

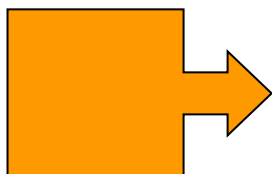
Ta'lim sohasidagi davlat siyosatining asosiy prinsiplari quyidagilardan iborat:

- ✓ ta'lim va tarbiyaning insonparvar, demokratik xarakterda ekanligi;
- ✓ ta'limning uzluksizligi va izchilligi;
- ✓ umumiy o'rta, shuningdek o'rta maxsus, kasb hunar ta'limining majburiyligi
- ✓ o'rta maxsus, kasb hunar ta'limining yo'nalishini: akademik litseyda yoki kasb hunar kollejida o'qishning tanlashning ixtiyoriyligi;
- ✓ ta'lim tizimining dunyoviy xarakterda ekanligi;
- ✓ davlat ta'lim standartlari doirasida ta'lim olishning hamma uchun ochiqligi;
- ✓ ta'lim dasturlarini tanlashga yagona va tabaqalashtirilgan yondashuv;
- ✓ ta'lim tizimida davlat va jamoat boshqaruvini uyg'unlashtirish;

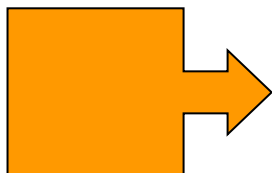
Ta'lim sohasida davlat boshqaruvi organlari nodavlat ta'lim muassasalarida ta'lim to'g'risidagi qonun hujjatlariga rioya etilishini nazorat qiladi. Nodavlat ta'lim muassasalari ta'lim to'g'risidagi qonun hujjatlarini buzgan taqdirda, akkridatsiya qilgan organlar ularning faoliyatini qonun hujjatlariga muvofiq to'xtab qo'yishga haqli. Nodavlat ta'lim muassasalariga qabul davlat o'quv yurtlari uchun belgilangan tartibda va muddatlarda amalga oshiriladi. Voaga yetmagan bolalarning ota-onalari yoki qonuniy vakillari bolaning qonuniy huquqlari va manfaatlarini himoya qilishlari shart hamda ularning tarbiyasi, maktabgacha, umumiy o'rta maxsus, kasb hunar ta'limi olishlari uchun javobgardirlar.

Respublikamizda hozirgi kunda barcha ta'lim sohalari qatori kimyo faniga ham katta e'tibor berilmoqda. Yangidan-yangi kimyoviy texnologiyalar kimyo sanoatini rivojlanishiga o'z hissani qo'shmoqda. Ta'lim jarayonida kimyo fanini o'quvchi yoshlarga to'liq yetqazib berish, dars jarayonlarini zamonaviy texnologiyalar asosida tashkil etish, laboratoriya xonalarini so'ngi rusimdagi jihozlar bilan taminlashga katta e'tibor berilmoqda. Hozirgi kunda kimyo mutaxasislarni tayyorlaydigan bir qancha talim muassasalari faoliyat ko'rsatmoqda.

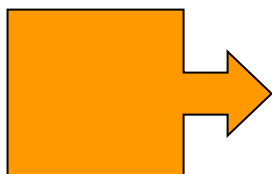
Quyidagi kurs ishi Tuzlar mavzusiga bag'ishlanadi .Ushbu kurs ishida tuzlarning sinflari shuningdek ularning ahamiyati to'g'risida so'z boradi. Tuzlar tabiatda keng tarqalgan binar birikmalar bo'lib, ulardan turli sohalarda foydalaniladi. Murakkab moddalar ichida eng ko'p tarqalgan va xalq xo'jaligidagi eng ko'p ishlatiladigan anorganik moddalar tuzlar hisoblanadi. Ushbu kurs ishida quyidagilar haqida batavsil ma'lumotlar beriladi:



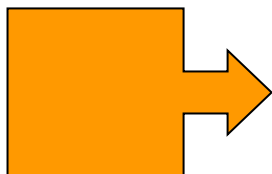
**Tuzlar haqida qisqacha
ma'lumot.**



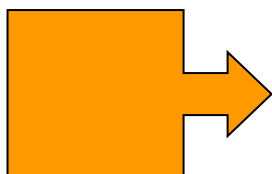
**O'rta (normal) tuzlar
nomenklaturasi va olinishi.**



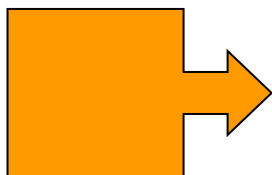
**Nordon tuzlar nomeklaturasi va
olinishi.**



**Asosli tuzlar nomeklaturasi
va olinishi.**



**Qo'sh tuzlar nomeklaturasi
va olinishi.**



**Kompleks tuzlar. Tuzlarning
umumiy xossalari.**

Asosiy qism.

1.Tuzlar haqida qisqacha ma'lumot.

TUZLAR – metall atomlari va kislota qoldig'idan iborat murakkab moddalar (kislota molekulasidagi vodorod atomlarining metallar bilan almashinishidan hosil bo'ladigan murakkab moddalar).Umuman, tuzlar gidroksidlar va kislotalarning o'zaro ta'siri mahsuloti bo'lib, ular turli tarkibli bo'ladilar. Tuzlarning umumiy formulasi M_nK_m tarzida ifodalanadi: bu yerda M-metall atomi (yoki ammoniy NH_4^+); K-kislota qoldig'i; n-kislota qoldig'ining valentligi; m-metall atomi valentligi. Masalan: $NaCl$, Rb_2SO_3 , $Be(NO_3)_2$, $NaHCO_3$, $KNaSO_4$, $Ca(H_2PO_4)_2$, $CaOCl_2$, $K_4[Fe(CN)_6]$, $AlOHSO_4$, $(CuOH)_2CO_3$, K_2ZnO_2 va h.k.

Demak tuzlarni kislota va asoslarning neytrallanish reaksiyasi mahsuloti deb qarab, agar kislota asos o'zaro ekvivalent miqdorda olingan bo'lsa o'rta tuzlar;

Agar kislota ortiqcha asos kam olingan bo'lsa, nordon tuzlar hosil bo'ladi.

Agar asos ortiqcha kislota kam olingan bo'lsa, asosli tuzlar hosil bo'ladi.

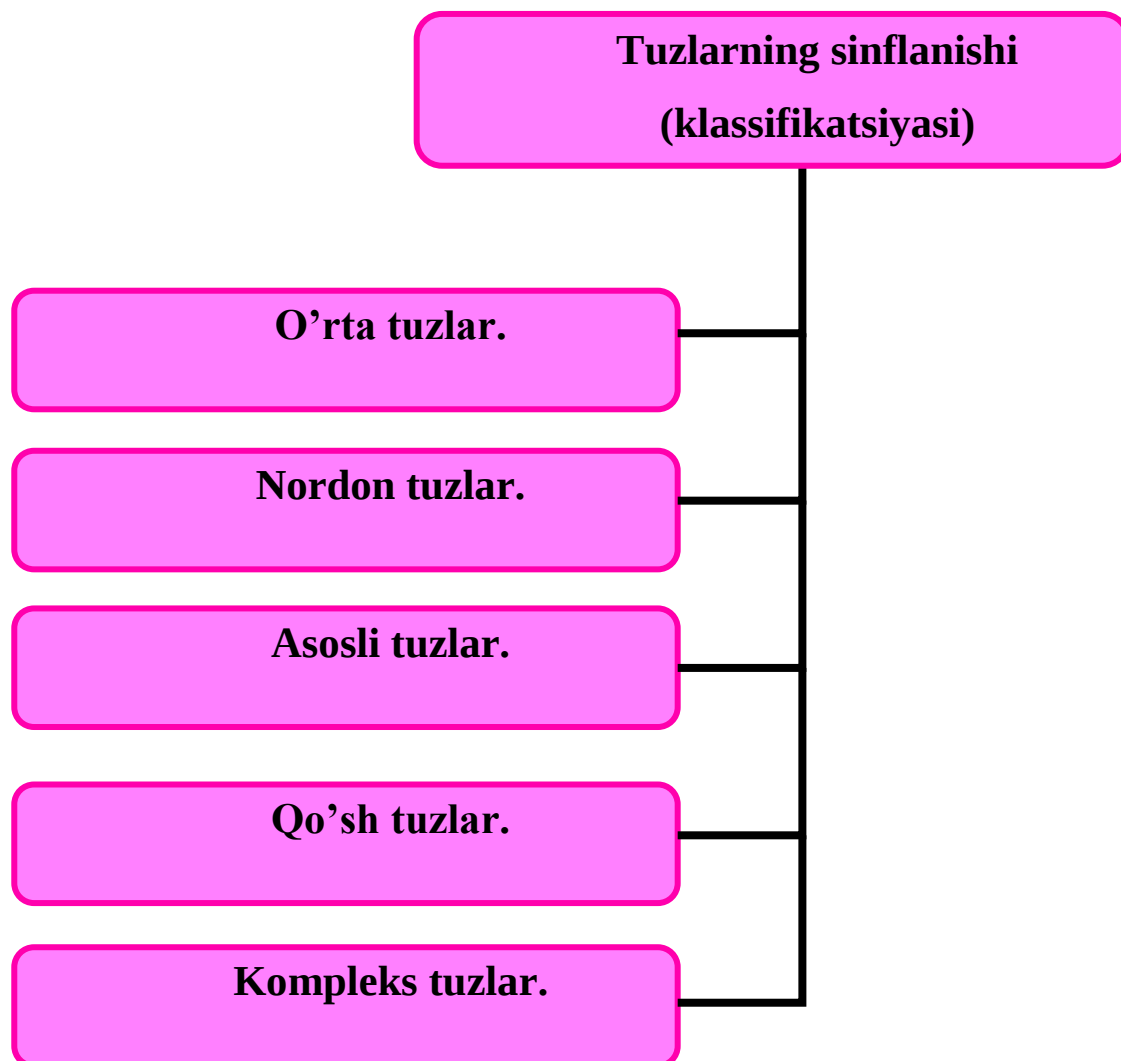
Kalsiy,temir, kaliy, natriy va boshqa ko'plab metallar tutgan tuzlar tibbiyotda turli kasalliklarga qarshi dori vositalari sifatida qo'llaniladi.

Azot, fosfor, kaliy, oltingugurt, kalsiy, natriy va mikroelementlar deb nomlanuvchi metal guruhini tutgan tuzlar qishloq xo'jaligida o'g'itlar, ba'zi zararkunandalarga qarshi kurash vositalari, unuvchanlik va hosildorlikni oshiruvchi, o'stiruvchi vositalar sifatida keng qo'llaniladi.

Shuningdek inson organizmi tuz muvozanatini doimo saqlab turishga muhtojdir va organizm umumiy massasiga nisbatan 5.5% turli xildagi tuzlar va shu vazifani bajarib turadi. Masalan, organizmda kalsiy tuzlari kamayib ketsa, muvozanatni tiklash uchun kalsiy tutgan mahsulotlarni iste'mol qilish xohishi paydo bo'ladi. Yoki turli sabablarga ko'ra organizm tez suyuqlik yo'qotadigan bo'lib qolganda, tez suyuqlik bilan chiqib ketib qoladi, shuning uchun bunday hollarda turli fiziologik tuz eritmalari beriladi.

Barcha tuzlar qattiq moddalar bo'lib, turli rangda bo'ladilar. Ular suvda eruvchanligi bo'yicha yaxshi eriydigan ($NaCl$, KCl , NH_4NO_3 , KNO_3 , $CaCl$ va hokazo), kam eruvchan ($CaSO_4$, $PbCl$, Ag_2SO_4 va hokazo) va juda kam eruvchan ($CaCO_3$, $BaSO_4$, $CaSiO_3$ va hokazo) larga bo'linadi.

Tuzlarning sinflanishi (klassifikatsiyasi)ga ko'ra besh guruhga bo'linadi va har bir guruh bir –biridan tubdan farq qiladi.



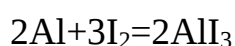
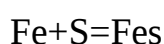
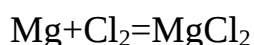
2.O'rta (normal) tuzlar nomenklaturasi va olinishi.

O'rta (normal) tuzlar – metall atomi va kislota qoldig'idan iborat murakkab moddalar. Masalan: NaCl, CaSO₄, Cu(NO₃)₂, Al₂(CO₃)₃, Fe₃(PO₄)₂, MnCl₃, TiCl₄ va h.k. O'rta tuzlarni nomlash: metall nomi (metall o'zgaruvchan valentli bo'lsa va bir necha xil tuzlar hosil qilsa, rim raqamda qavs ichida valentlik ko'rsatiladi va qavsdan keyin chiziqcha qo'yiladi hamda)ga kislota qoldig'i nomi qo'shib aytiladi. Masalan: NaCl – natriy xlorid, CaSO₄ – kaltsiy sulfat, Cu(NO₃)₂ – mis (II) nitrat, Al₂(CO₃)₃ – alyuminiy karbonat, Fe₃(PO₄)₂ – temir (II) fosfat, MnCl₃ – marganets (III) xlorid, TiCl₄ – titan (IV) xlorid va hokazo.

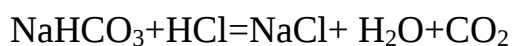
Agar bir metall bitta kislota bilan ikki yoki bir necha tuz xosil qilsa, bunday tuzlarni nomlashda avval metall nomi aytilib, qavs ichida rim raqami bilan metallning valentligi ko'rsatiladi, so'ngra kislota nomi aytiladi. Masalan, FeSO₄ — temir (II)-sulfat, Fe(NO₃)₂ — temir (II)-nitrat, Fe(NO₃)₃ — temir (III) nitrat va xokazo. Normal tuzlar texnik nomlar bilan ham atalishi mumkin. Masalan, NaCl-osh tuzi, Na₂CO₃ – soda, K₂CO₃ – potash, K₂SO₄*Al₂(SO₄)₃-achchiqtosh CuSO₄*5H₂O – mis kuporosi, KNO₃ – kaliyli selitra va hokazo.

O'rta tuzlar quyidagi usullar bilan olinadi:

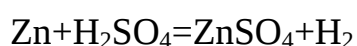
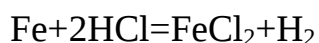
- 1) Metallarning metallmaslar bilan ta'sirida.



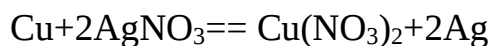
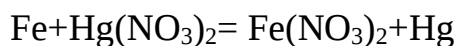
- 2) Nordon tuzlar ishqorlar va kislotalar bilan reaksiyaga kirishib yangi o'rta tuz va suv (kislota yoki oksidni) hosil qiladi.



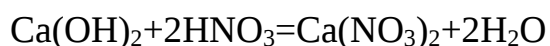
- 3) Metallarning kislotalar bilan ta'sirida.



4) Metallarning tuzlar bilan ta'sirida.



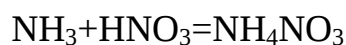
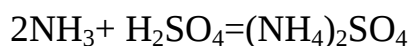
5) Hidroksidlar va kislotalarning o'zaro ta'sirida.



6) Galogenlarning ishqorlarda erishidan.



7) Ammiakning kislotalar bilan birikishi tufayli o'rta tuz hosil bo'lishi.

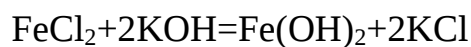


Xossalari:

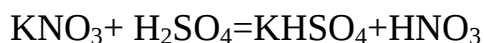
Fizik xossalari: deyarli barcha tuzlar qattiq turli rangdagi kristall moddalar bo'lib, suvda har xil erish qobiliyatiga ega. Tuzlar tarkibiga kristallizatsion suv tutishi mumkin. Masalan mis kuparosi $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$.

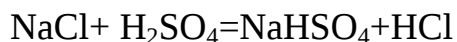
Kimyoviy xossalari. Tuzlar kimtoviy jihatdan faol moddalar bo'lib, ko'plab o'zgarishlarga uchraydi. Quyida misollarda o'rta tuzlarning kimyoviy xossalari bilan tanishib chiqamiz.

1. O'rta tuzlar ishqorlar va kislotalar ta'sirida quyidagilarni hosil qiladi.

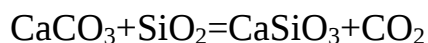
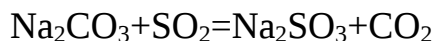


2. O'rta tuzlarning kislotalarga ta'siri natijasida yangi tuz va yangi kislota hosil bo'ladi.

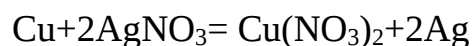
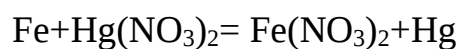




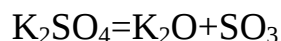
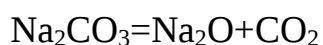
3.O'rta tuzlar kislotali oksidlar bilan ta'sirlashib ,yangi tuz va yangi kislotali oksid hosil qiladi.



4.O'rta tuzlarning metallarga ta'siri natijasida yangi tuz hosil bo'lib, yangi metall ajralib chiqadi.



5.Temperatura natijasida parchalanadi.



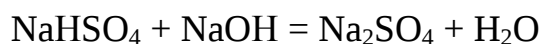
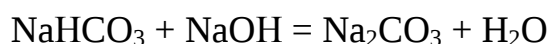
3.Nordon tuzlar nomenklaturasi va olinishi.

Nordon tuzlar – kislota molekulasidagi vodorod atomlari metall bilan qisman almashinganda hosil bo'lib, metall atomi, vodorod va kislota qoldig'idan iborat bo'ladi. Masalan: $\text{Ca}(\text{HCO}_3)_2$, NaHCO_3 , $\text{Cu}(\text{HSO}_4)_2$, KHS , $\text{Ba}(\text{HSO}_3)_2$, NaHSO_4 , LiHSO_4 , $\text{Mg}(\text{HCO}_3)_2$ va hokazo. Nordon tuzlarni nomlash: metall nomi (metall o'zgaruvchan valentli bo'lsa rim raqamda qavs ichida valentlik ko'rsatiladi)ga molekulada bitta vodorod bo'lsa “gidro” so'zi, ikkita vodorod bo'lsa “digidro” so'zi va kislota qoldig'i nomi qo'shib aytiladi. Masalan: $\text{Ca}(\text{HCO}_3)_2$ – kalg'tsiy gidrokarbonat, NaHCO_3 – natriy gidrokarbonat, $\text{Cu}(\text{HSO}_4)_2$ – mis (II) gidrosulfat, $\text{Fe}(\text{H}_2\text{PO}_4)_2$ – temir (II) digidrofosfat, KHS – kaliy gidrosulfid, Li_2HPO_4 – litiygidrofosfat, $\text{Ba}(\text{HSO}_3)_2$ – bariy gidrosulfit, $\text{Ca}(\text{H}_2\text{PO}_4)_2$ – kaltsiy digidrofosfat va h.k.

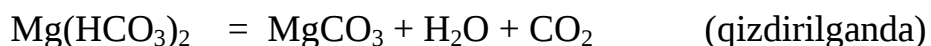
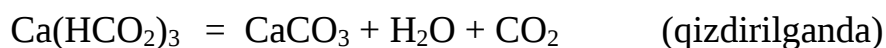
Nordon tuzlar suvdagi eritmalarida ikki bosqichda (metall xamda vodorod) kation va bitta (kislota qoldig'i) anion xosil qilish bilan dissotsilanadi: Nordon tuzlar suvdagi eritmalarida ikki bosqichda dissotsilanadi:



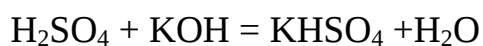
$\text{HCO}_3^- = \text{H}^+ + \text{CO}_3^{2-}$ Nordon tuzlardagi vodorod metal atomlariga o'rin bera oladi, natijada, normal tuzlar hosil bo'ladi:



Nordon tuzlar qizdirilganda o'zidan suv ajratib chiqaradi va normal tuzga o'tadi:



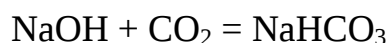
Olinish usullari: 1.Kislotalarga kam miqdorda ishqor qo'shish bilan nordon tuz hosil qilish mumkin:



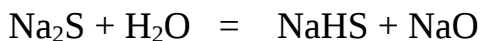
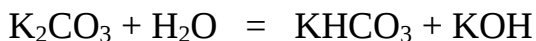
2. Tuzlarga oz miqdorda kislota qo'shib nordon tuz hosil qilish mumkin:



3.Asoslarga mo'l miqdorda kislotali oksid ta'sir qilib ham nordon tuz hosil qilinadi:

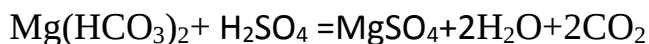
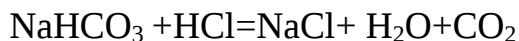


4. Bir valentli metal bilan ikki asosli kislota qoldig'idan hosil bo'lgan tuzlarni gidrolizga uchratish yo'li bilan ham nordon tuzlar olish mumkin:



Xossalari:

1. Nordon tuzlar ishqorlar va kislotalar bilan reaksiyaga kirishib yangi o'rta tuz va suv (kislota yoki oksidni) hosil qiladilar:



2. Nordon tuzga o'rta tuzning ta'siri:



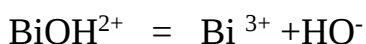
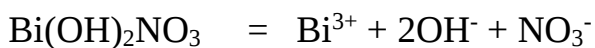
4. Asosli tuzlar nomenklaturasi va olinishi.

Asosli tuzlar – tarkibida metall atomi, gidroksid guruhi va kislota qoldig'i saqlagan murakkab moddalar. Gidrokso-tuzlarni nomlashda avval metall nomi aytilib, «Gidrokso» so'zi qo'shiladi, so'ngra kislota nomi aytiladi. Masalan: $(\text{CuOH})_2\text{CO}_3$, $\text{Mg}(\text{OH})\text{NO}_3$, $\text{Al}(\text{OH})_2\text{Br}$, $\text{Cr}(\text{OH})_2\text{NO}_3$, $\text{Mn}(\text{OH})\text{Cl}$, $[\text{Fe}(\text{OH})_2]_2\text{SO}_4$, $\text{Cr}(\text{OH})(\text{CH}_3\text{COO})_2$, $\text{Al}(\text{OH})\text{SO}_3$ va h.k. Asosli tuzlarni nomlash: metall nomi (metall o'zgaruvchan valentli bo'lsa rim raqamda qavs ichida valentlik ko'rsatiladi)ga molekulada bitta gidroksid guruhi bo'lsa “gidrokso” so'zi, ikkita gidroksid guruhi bo'lsa “digidroksi” so'zi va kislota qoldig'i nomi qo'shib aytiladi. Masalan: $(\text{CuOH})_2\text{CO}_3$ – mis (II) gidroksi karbonat, $\text{Mg}(\text{OH})\text{NO}_3$ – magniy gidroksi nitrat, $\text{Al}(\text{OH})_2\text{Br}$ alyuminiy digidroksibromid, $\text{Cr}(\text{OH})_2\text{NO}_3$ – xrom (III) digidroksinitrat, $\text{Mn}(\text{OH})\text{Cl}$ – marganets (II) gidroksixlorid, $[\text{Fe}(\text{OH})_2]_2\text{SO}_4$ – temir (III) digidroksisulfat, $\text{Cr}(\text{OH})(\text{CH}_3\text{COO})_2$ –

xrom (III) gidroksiatsetat, Al(OH)SO_3 – alyuminiy gidroksisulfit, $\text{Fe(OH)}_2\text{Cl}$ -temir digidroksoxlorid, $\text{Ti(OH)}_3\text{Cl}$ - titan trigidroksoxlorid, Ni(OH)NO_3 - nikel gidroksonitrat. Gidrokso–tuzlar qizdirilganida yoki umuman vaqt o'tishi bilan tarkibida suv molekulalarini chiqarib, okso-tuzlarga aylanadi: $2\text{Mg(OH)Cl} \rightarrow \text{Mg}_2\text{OCl}_2 + \text{H}_2\text{O}$ Okso-tuzlar ham asoslar xosasini namoyon qiladi. Binobarin, kislota ta'sirida okso-tuzlarni normal tuzga aylantirish mumkin:

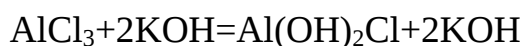
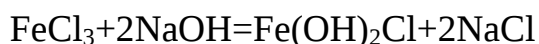
Gidrokso-tuzlar dissotsilanganda metall kationi, kislota qoldig'i va gidroksil anioniga dissotsilanadi;

masalan:

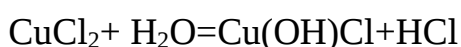


Gidrokso-tuzlarning olinishi:

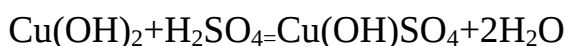
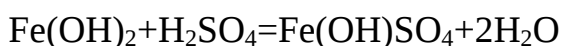
1.O'rta tuzlarga ishqor ta'sir ettirganda yangi asosli tuz va o'rta tuz hosil bo'ladi.



2.Gidrokso-tuzlar normal tuzlarning gidrolizi natijasida hosil bo'ladi.



3.Asoslarga oz miqdorda kislota ta'sir ettirib gidrokso-tuzlarning olinishi.

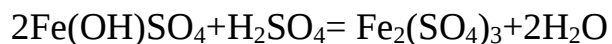


Xossalari:

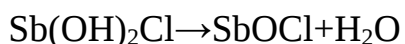
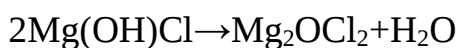
Fizik xossasi: Gidrokso-tuzlar suvda yomon eriydi.

Kimyoviy xossalari:

1. Hidrokso-tuzlarning kislotaga ta'siridan o'rta tuz hosil bo'ladi.



2. Hidrokso-tuzlar qizdirish yoki umuman vaqt o'tishi bilan suv molekulalarini chiqarib, okso-tuzlarga aylanadi.

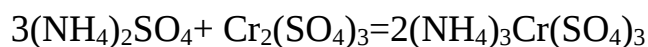
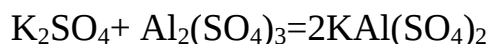
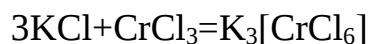
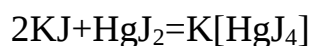


5. Qo'sh tuzlar nomenklaturasi va olinishi.

Qo'sh tuzlar – kislotada molekulasidagi vodorod atomlari har xil metal bilan almashinganda hosil bo'lgan murakkab moddalar. Masalan: $\text{KAl}(\text{SO}_4)_2$, $\text{KCr}(\text{SO}_4)_2$, $(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2$ va h.k. Qo'sh tuzlarni nomlash: avval valentligi katta metall nomi keyin valentligi kichik metall nomi (metall o'zgaruvchan valentli bo'lsa rim raqamda qavs ichida valentlik ko'rsatiladi)ga kislotaga qoldig' nomi qo'shib aytiladi. Ular achchiqtoshlar ham deyiladi. Masalan: $\text{KAl}(\text{SO}_4)_2$ – alyuminiy kaliy sulfat, $\text{KCr}(\text{SO}_4)_2$ – xrom (III) kaliy sulfat, $(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2$ – temir (II) ammoniy sulfat yoki $\text{KAl}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$ – alyuminiy kaliyli achchiqtosh, $\text{KCr}(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$ – xrom kaliyli achchiqtosh, $(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$ – temir ammoniyli achchiqtosh va h.k.

Olinishi:

1. Qo'sh tuzlar ayrim tuzlarning o'zaro birikishi hisobiga hosil bo'ladi.

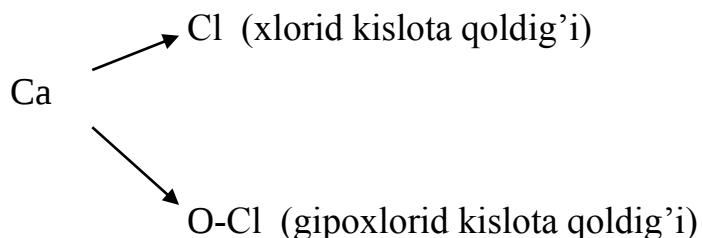
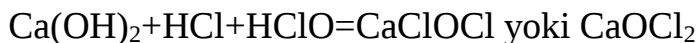


2. Agar ko'p asosli kislotaga ikki xil asos ta'sir ettirilganda qo'sh tuzlar hosil bo'ladi.





3. Agar ko'p kislotali asosga ikki xil kislota ta'sir ettirilsa qo'sh yoki aralash tuz hosil bo'ladi.



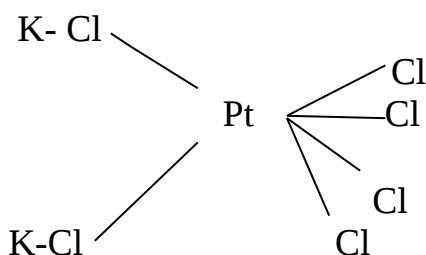
6. Kompleks tuzlar.

Kompleks tuzlar – tarkibida kompleks ion saqlagan murakkab moddalar. Masalan: $\text{K}_3[\text{Fe}(\text{CN})_6]$, $\text{K}_4[\text{Fe}(\text{CN})_6]$, $\text{Fe}_3[\text{Fe}(\text{CN})_6]_2$, $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$, $\text{Na}_3[\text{Co}(\text{NO}_2)_6]$, $\text{K}_3[\text{FeF}_6]$, $\text{K}_2[\text{PtF}_4]$, $\text{Na}_2[\text{HgI}_4]$, $[\text{CrCl}_2(\text{H}_2\text{O})_4]\text{Cl}$, $[\text{CrCl}_3(\text{H}_2\text{O})_3]$ va h.k. Kompleks tuzlarni nomlash: asosan tarixiy nomlar ishlatiladi, masalan: $\text{K}_3[\text{Fe}(\text{CN})_6]$ – qizil qon tuzi, $\text{K}_4[\text{Fe}(\text{CN})_6]$ – sariq qon tuzi, $\text{Fe}_3[\text{Fe}(\text{CN})_6]_2$ – berlin zangorisi, $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$ – turunbul ko'ki va h.k. Bundan tashqari kompleks tuzlar sistematik quyidagicha nomlanadi: $\text{K}_3[\text{Fe}(\text{CN})_6]$ – kaliy geksatsianoferrat (III), $\text{K}_4[\text{Fe}(\text{CN})_6]$ – kaliy geksatsianoferrat (II), $\text{Fe}_3[\text{Fe}(\text{CN})_6]_2$ – temir (II) geksatsianoferrat (III), $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$ – temir (III) geksatsianoferrat (II), $\text{Na}_3[\text{Co}(\text{NO}_2)_6]$ natriy geksanitrito kobaltat (III), $\text{K}_3[\text{FeF}_6]$ kaliy geksaftoroferrat (III), $\text{K}_2[\text{PtF}_4]$ – kaliy tetraftoroplatinat (II), $[\text{CrCl}_2(\text{H}_2\text{O})_4]\text{Cl}$ – dixlorotetraakva xrom (III) xlorid, $[\text{CrCl}_3(\text{H}_2\text{O})_3]$ – trixlorotriakva xrom (III) va h.k. Ba'zi murakkab moddalar boshqa murakkab moddalar bilan reaksiyaga kirishib yanada murakkabroq moddalar hosil qiladi. Hosil bo'lgan moddalar XIX asrning oxirlarida kompleks birikmalar deb ataladigan bo'ldi. Kompleks birikmalar hosil bo'ladigan jarayonning mohiyatini tushunib olish uchun 1893 yilda Shveytsariya kimyogari A.Verner taklif qilgan va L.Chugaev, I.Chernyaev, A.Grinberg va boshqalar

tomonidan to'ldirilgan kordinatsion nazariya bilan qisqacha tanishib o'tamiz. Bu nazariyaning asosiy bandlari quyidagilardan iborat:

1. Kompleks birikmalardagi ion yoki atomlardan biri markaziy ion (yoki markaziy atom) hisoblanadi va uni kompleks hosil qiluvchi deb ataladi.
2. Kompleks hosil qiluvchi markaziy ion (yoki atom) atrofiga ma'lum son qarama-qarshi zaryadli ionlar yoki qutblangan molekulalar (ligandlar) joylashadi (boshqacha aytganda ular koordinatsiyalanadi).
3. Markaziy ion yoki atomning qo'shimcha valentliklari fazoda ma'lum yo'nalishlarga ega bo'ladi.
4. Markaziy ion yoki atom ligandlar bilan birga kompleksning ichki sferasini hosil qiladi.
5. Markaziy ion yoki atom bilan bevosita birikkan ligandlar soni 2,4,6,8 ga teng bo'ladi.
6. Markaziy ion yoki atomdan uzoqroq joylashgan ionlar kompleksning tashqi sferasini tashkil qiladi.

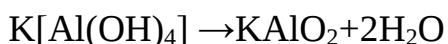
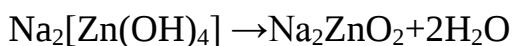
A. Vernerning fikricha birinchi tartibdagi birikmalar asosiy valentliklar hisobiga hosil bo'ladi. Kompleks birikmalar esa qo'shimcha valentliklar hisobiga hosil bo'ladi. Masalan: PtCl_4 bilan 2KCl birikib, $\text{PtCl}_4 \cdot 2\text{KCl}$ ni hosil qilganda Pt va Cl atomlari o'zlarining asosiy valentligidan tashqari yana qo'shimcha valentliklar namoyon qiladi:



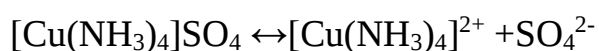
bu erda qora chiziqlar asosiy valentlikni, punktir chiziqlar qo'shimcha valentlikni qo'rsatadi. Hozirgi zamon termini bilan aytganda asosiy valentlik elementning ayni birikmadagi oksidlanish darajasini, qo'shimcha valentlik esa uning koordinatsion sonini ko'rsatadi. $\text{PtCl}_4 \cdot 2\text{KCl}$ da platinaning asosiy valentligi 4 ga, qo'shimcha valentligi 6 ga tengdir. Kompleks tarkibida markaziy atom bilan bevosita birikkan ligandlar orasidagi bog'lanishlar soni markaziy atomning koordinatsion soni deb ataladi. Kompleksda markaziy atom bilan ligandlar orasidagi barcha bog'lanishlar bir xil kuchga ega bo'ladi. Bir valentli elementning koordinatsion soni ko'pincha 2 ga teng bo'ladi: $[\text{Ag}(\text{NH}_3)_2]\text{Cl}$, $\text{K}[\text{Ag}(\text{CN})_2]$. Ikki valentlilarning koordinatsion sonlari ko'pincha to'rtga, ba'zan uchga va oltiga teng bo'ladi: $\text{Na}[\text{RbI}_3]$, $\text{K}_4[\text{Fe}(\text{CN})_6]$, $[\text{Zn}(\text{NH}_3)_4]\text{Cl}_2$. Uch va to'rt valentli elementlarning koordinatsion sonlari asosan oltiga teng: $\text{K}_3[\text{Fe}(\text{CN})_6]$.

Kompleks tuzlarning xossalari:

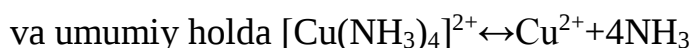
1. Amfoter metallardan hosil bo'lgan kompleks tuzlarning hammasi qizdirilganda parchalanadi.



2. Kompleks tuzlar elektrolit moddalar singari eritmada bosqichma-bosqich ionlarga ajraladi. Bunda dastlab tashqi sferadagi ionlarga va ichki sferaga ajraladi.



Keyingi bosqichda ichki sfera ham bosqichli ajraladi, yani metal ioniga va ligantlarga bo'linib ketadi.

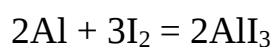
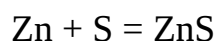
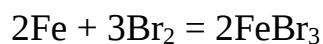
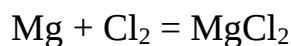


Tuzlar uchun umumiy bo'lgan xossalar.

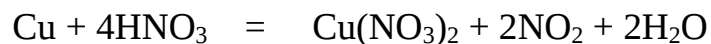
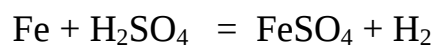
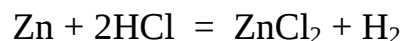
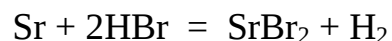
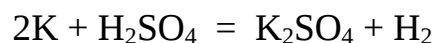
Tuzlarning olinish usullari

Tuzlar juda ko'p usullar bilan hosil qilinadi. Quyida ularning ayrimlari bilan tanishib chiqamiz.

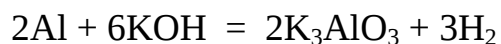
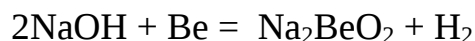
1. Metallar bilan metalmaslarning bevosita ta'siri:



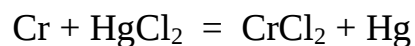
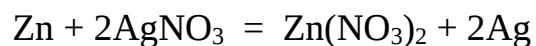
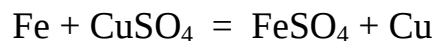
2. Metallarni kislotalar bilan ta'siri:



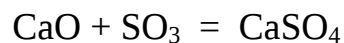
3. Metallarni ishqorlar bilan ta'siri:

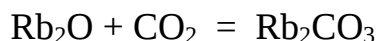
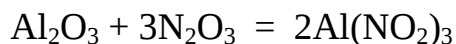


4. Metallarni tuzlar bilan ta'siri:

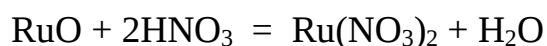
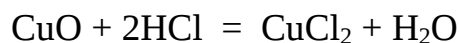
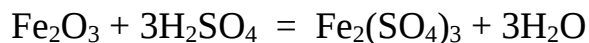


5. Asosli oksidlarni kislotali oksidlar bilan ta'siri:

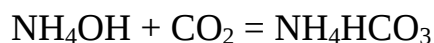
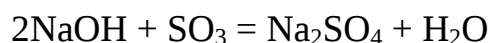
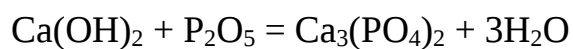




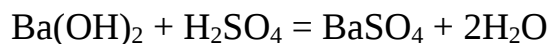
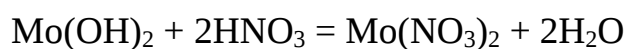
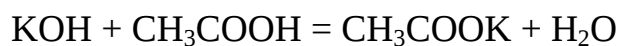
6. Asosli oksidlarni kislotalar bilan ta'siri:



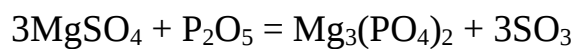
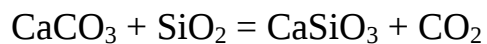
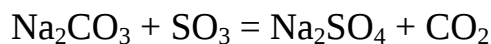
7. Kislotali oksidlarni asoslar bilan ta'siri:



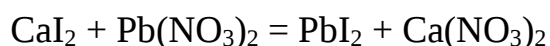
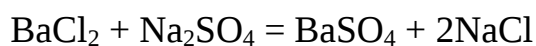
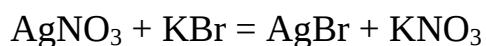
8. Asoslar va kislotalarning o'zaro ta'siri:



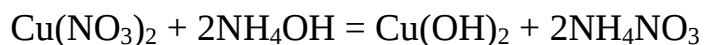
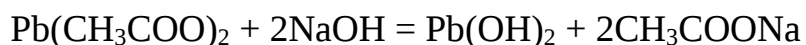
9. Kislotali oksidlarning tuzlar bilan tasiri:

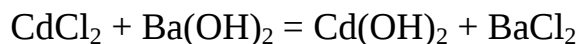


10. Tuzlarning o'zaro tasiri:

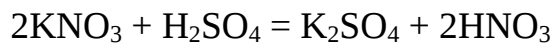
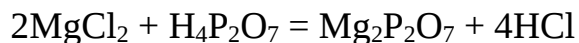
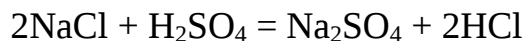


11. Tuzlarning ishqorlar bilan tasiri:





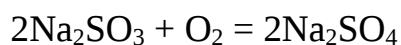
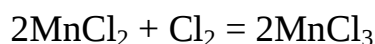
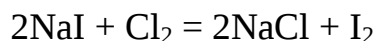
12. Tuzlarning kislotalar bilan tasiri:



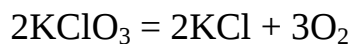
13. Metalmaslar bilan ishqorlarning tasiri:



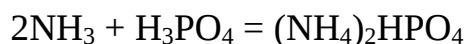
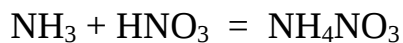
14. Metalmaslar bilan tuzlarning tasiri:



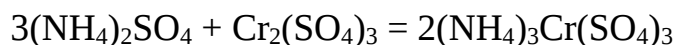
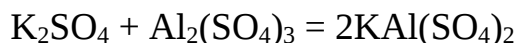
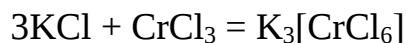
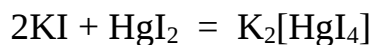
15. Tuzlarning termik parchalanishi:



16. Ammiakning kislotalarga birikishi:



17. Tuzlarning o'zaro birikishi:



Barcha tuzlar uchun umumiy bo'lgan fizik xossalar.

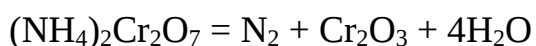
Barcha tuzlar oddiy sharoitda qattiq moddalar bo'lib, tabiatda turli rangda uchraydi. Ular suvda eruvchanligiga qarab, 1) Yaxshi eruvchan (NaCl , Na_2SO_4 , KNO_3 , NH_4NO_3 , CaCl_2), 2) Kam eruvchan (CaSO_4 , Ag_2SO_4 , PbCl_2), 3) Deyarli erimaydigan (BaSO_4 , CaCO_3 , CaSiO_3 , $\text{Al}_2(\text{SiO}_3)_3$) kabi turlarga bo'linadi. Tuzlar oziq-ovqat sanoatida, qishloq xo'jaligida o'g'it sifatida, tibbiyotda dori sifatida, laboratoriyalarda sintezda katalizator sifatida, umuman juda ko'p sohalarda ishlatiladi. Bundan tashqari Tuzlar suvda eriganda teskari qonuniyatlar kuzatiladi.

Ishqoriy metallar karbonatlaridan hosil bo'lgan tuzlar Masalan: Na_2CO_3 , K_2CO_3 , , Li_2CO_3 va hokazolar suvda yaxshi eriydi. Ammo ularning gidrokarbonatlari (NaHCO_3 , KHCO_3 , LiHCO_3) suvda yomon eriydi .

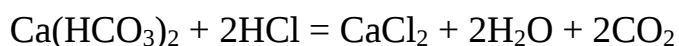
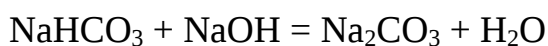
Ishqoriy yer metallari karbonatli tuzlarida teskari jarayonni kuzatishimiz mumkin. Masalan: MgCO_3 , CaCO_3 , BaCO_3 va hokazolar suvda erimaydi. Ammo ularning gidrokarbonatlari $\text{Mg}(\text{HCO}_3)_2$, $\text{Ca}(\text{HCO}_3)_2$, $\text{Ba}(\text{HCO}_3)_2$ suvda yaxshi eriydi.

Barcha tuzlar uchun umumiy bo'lgan kimyoviy xossalar bilan tanishib chiqamiz.

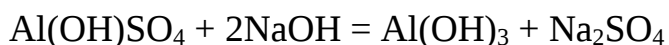
1. Deyarli barcha tuzlar qizdirilganda parchalanadi:

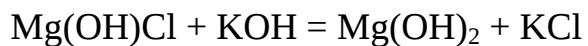


2. Nordon tuzlar ishqorlar va kislotalar bilan reaksiyaga kirishadi:

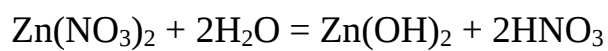
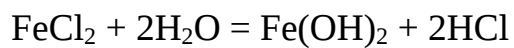
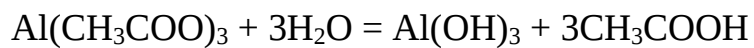
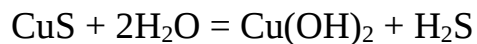


3. Asosli tuzlar ishqorlar va kislotalar bilan ta'sirlashadi:

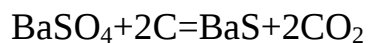
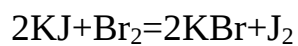
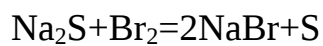
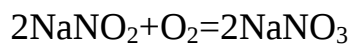




4. Ko'pchilik tuzlar suv ta'sirida parchalanadi:



5. Tuzlarning metallmaslarga ta'siri kamroq bo'lib, asosan oksidlanish-qaytarilish reaksiyalari hisoblanadi.



Xulosa.

Yuqorida ko'rib o'tganlarimizni umumlashtirib shuni aytamizki, biz organizmimizda kechadigan har qanday jarayonlar yoki ulardagi moddalar almashinuvi jarayonlari va shunga o'xshash barcha hodisalar suvli eritmada ketadi.

Bu jarayonlarning organizmimizda qanday bosqichda ketishini bilishimiz va albatta, bu jarayonlarni to'liq tushunishimiz zarurdir. Organizmimizda tuzlar miqdori yuqori foizlarni tashkil etadi. Misol uchun bu tuzlarga misol keltiradigan bo'lsak, kalsiy karbonat- suyak tarkibiga kirib, suyakning mustahkam va qattiqligini ta'minlaydi. Kalsiy fosfat – bu tuz ham suyak tarkibiga kirib, u ham mustahkamligini ta'minlaydi. Natriy xlorid – bu organizm uchun 0,9% li eritmasi fiziologik eritma hisoblanadi. Hujayra ichida va tashqarisida natriy va kaliy ionlari mavjud bo'lib, ular hujayra ichiga tashqarisiga ionlar almashinuvida muhim rol o'ynaydi. Bulardan tashqari, mis, nikel, temir, kobalt, zux, oltin, marganes va boshqa elementlarning qator tuzlari organizmda o'ta muhim vazifalarni bajaradi.

Demak biz tuzlarning xossalarini mukammal o'rganishimiz zarurdir. Chunki ular xossalariga ko'ra turli guruhlariga ajratilgan. Ushbu kurs ishimda tuzlar va uning guruhlariga batavsil to'xtalib o'tdim.

Kurs ishini o'rganishim mobaynida ko'pgina adabiyotlar shuningdek, internet ma'lumotlaridan samarali tarzda foydalandim. Kelajakdagi ilmiy faoliyatimda ushbu bilimlardan amaliyotda keng foydalanaman.

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