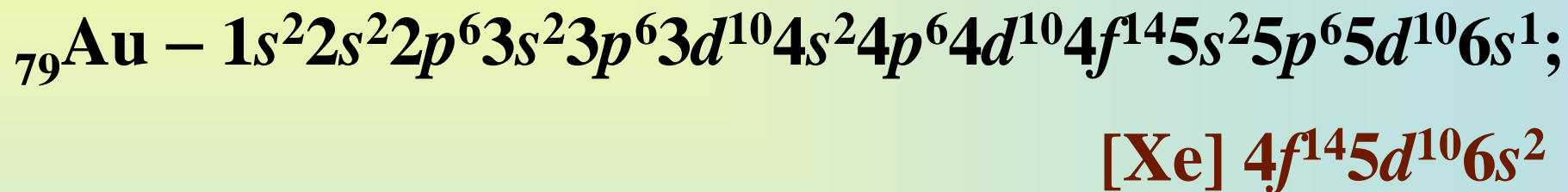
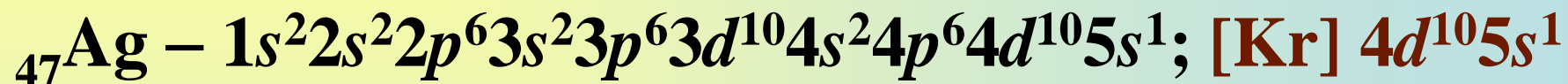
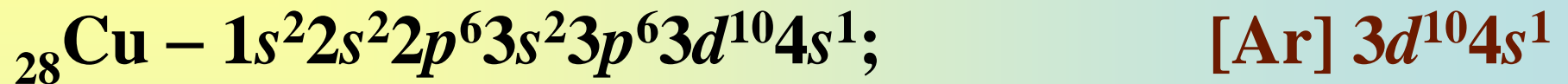


I gurug b guruhchasi

d - elementlari

Guruhning umumiy tavsifnomasi.



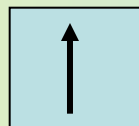
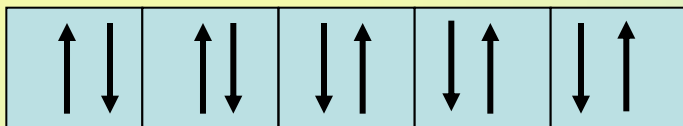
Cu...3d¹⁰4s¹ Cu²⁺ ... 3d⁹4s⁰ yoki ... Cu 3d⁹

3

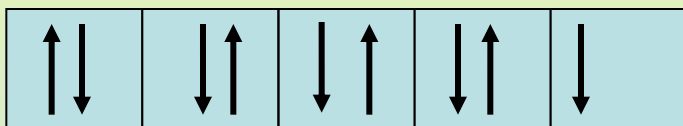
3d

4 s

Cu



Cu²⁺



1 gurug b guruhchasi d – elementlarining elektrod potentsiallari

Jarayon E^0_{298} ,	V
$\text{Cu}^{2+} + 2e^- = \text{Cu}$	0,337
$\text{Ag}^{1+} + 1e^- = \text{Ag}$	0,799
$\text{Au}^{3+} + 3e^- = \text{Au}$	1,5

.. H_2 ... Cu ... Ag ... Au ...

Mis uchun +2, kumush uchun +1, oltin uchun esa +3 oksidlanish darajalari nisbatan xarakterli hisoblanadi. Kumushning +1 oksidlanish darajasining barqarorligi $4d^{10}$ konfiguratsiyasining mustahkamligi bilan tushuntiriladi, bu konfiguratsiya Pd hosil bo'ladi.

**1 - guruh qo'shimcha guruhchasi
elementlarining atom radiuslari, asosiy
guruhcha elementlarinikiga nisbatan ancha
kichik, shu sababli mis, kumush va oltin katta
zichlikga va yuqori suyuqlanish haroratiga
egaligi bilan ajralib tiradi.**

Misdan kumushga o'tgan sari atom radiuslari ortadi, oltinda esa o'zgarmaydi, oltin davriy jadvalda lantanoidlardan keyyin joylashganligi sababli lantanoidli siqilish samarasini o'zidan o'tkazadi. Oltinning zichligi juda katta.

Ushbu elementlarning faolligi yuqori emas, elementni tartib raqami ortgan sari yana kamayadi.

Tabiatda tarqalishi.

Tabiatda turli birikmalar ko'rinishida uchraydi,

Cu_2S – mis yaltirog'i,

CuFeS_2 – mis kolchedani (xalkopirit),

Cu_3FeS_3 - bornit,

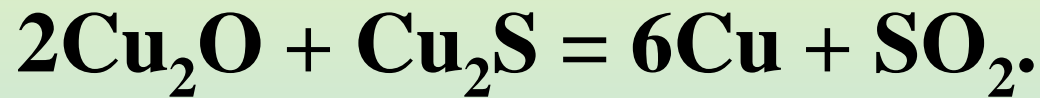
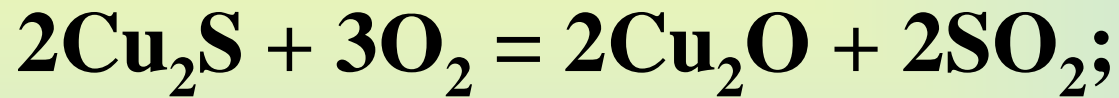
$\text{Cu}_2(\text{OH})_2\text{CO}_3$ yoki $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$ - malaxit

Mis - Cu

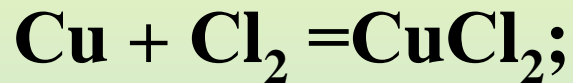
- ✓ qizil rangli ancha yumshoq metal,
- ✓ $T_{\text{suyul}} = 1083^{\circ}\text{C}$,
- ✓ yuqori elektr – va issiqlik o'tkazuvchanlikka ega,
- ✓ turli-tuman qotishmalar hosil qiladi.

Olinish usullari.

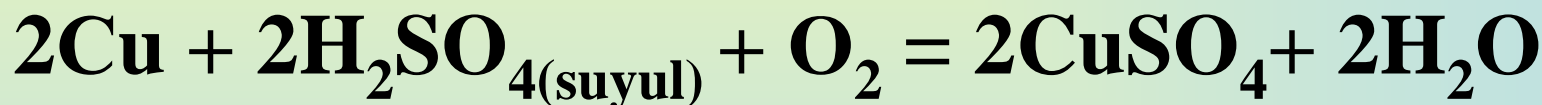
Mis (I) sulfid suyuqlanmasi orqali O₂ purkash usuli orqali:



Kimyoviy xossalari



(havoda – yashil rangli parda hosil bo'ladi);

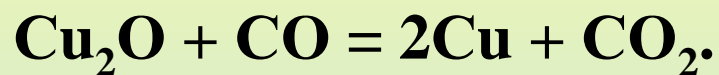
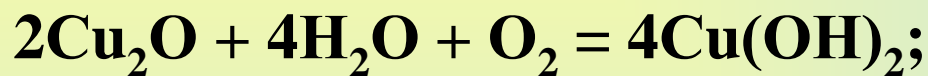
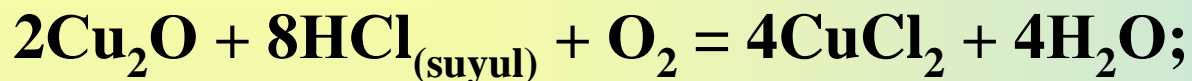
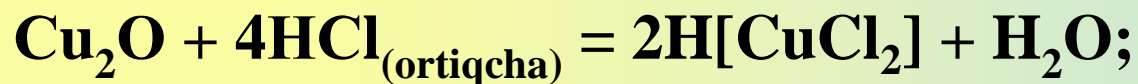
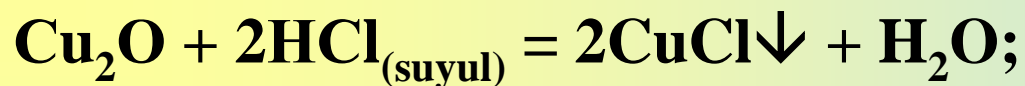


(Cu kukunini qaynatish).

Mis (I) - oksidi Cu_2O – to'q qizil rangli qattiq modda, asosli xossalarni namoyon qiladi.

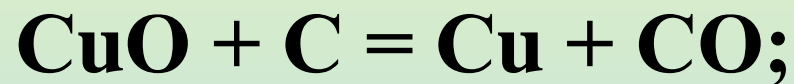
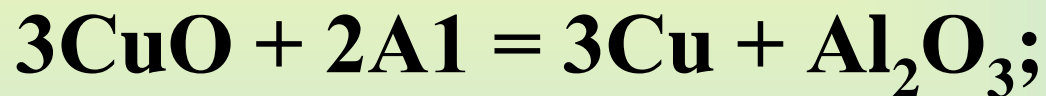
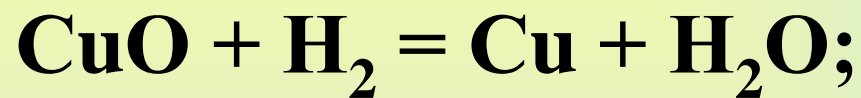
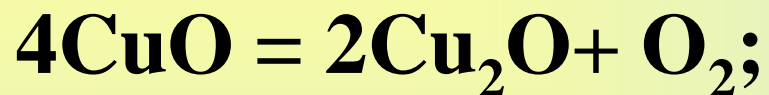
Mis (I) tuzlarining bir qismi suvda eruvchan, lekin havo kislorodi bilan oson oksidlanadi, Mis (I) kompleks birikmalari barqarordir

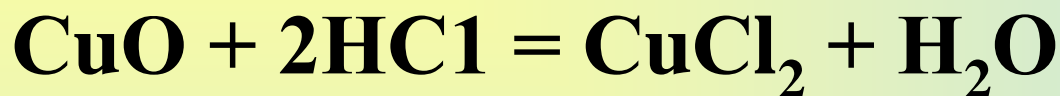
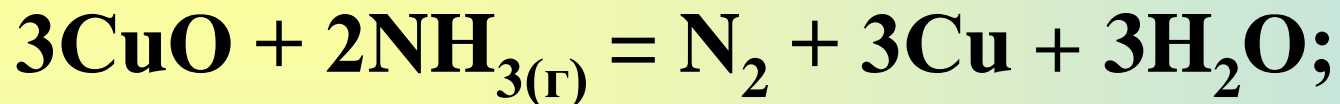
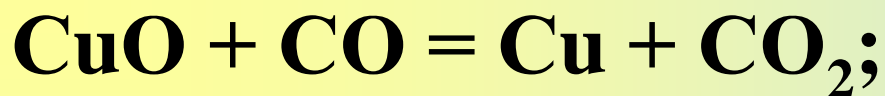




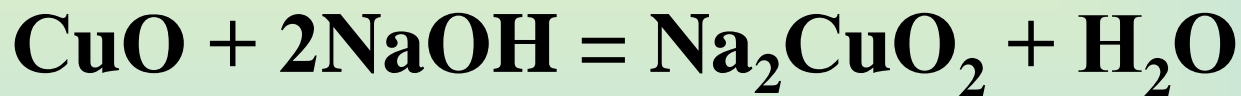
Cu(OH) gidroksidi barqaror emas va tezda oksidlanadi.

Mis (II)-oksidi CuO – qizil-qo'ng'ir rangli qattiq modda, asosli xossalarni namoyon etadi.





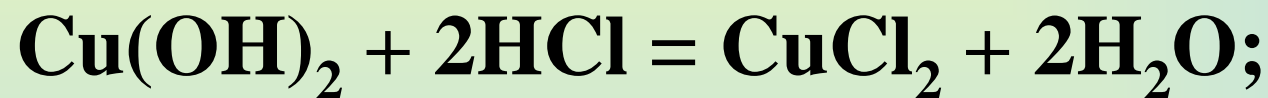
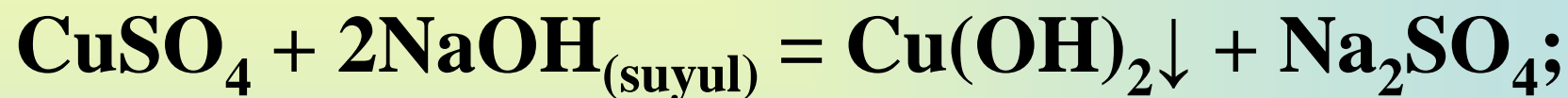
Ishqorlar bilan suyultirilganda kuchsiz amfoter xossani namoyon qiladi:



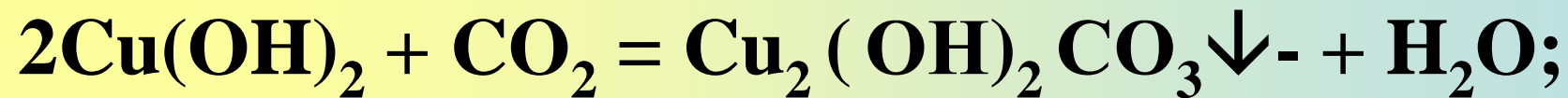
Mis (II)-gidroksidi $\text{Cu}(\text{OH})_2$ – havo rangli

birikma, suvda erimaydi, termik beqaror, asosli

xossaga ega, kuchsiz oksidlovchi:



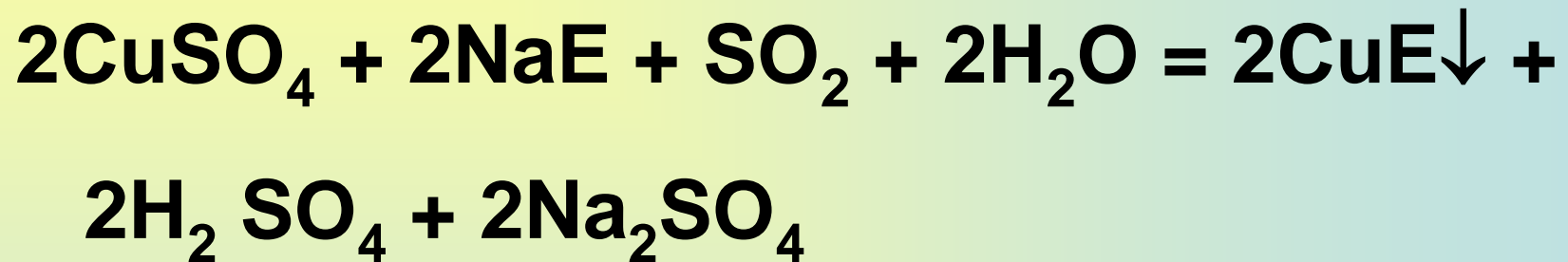
Ishqoriy metallar kupratlari ko'k rangga ega



Aldegidlarga sifat reaktsiyalari:



Mis (II) birikmalari – oksidlovchidir:



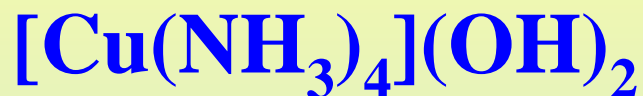
(E = Cl, Br, I, NCS)

Kuchli kislotalarning mis (II) tuzlari suvli eritmalarda ma'lum darajada gidrolizga uchraydi. Kation gidratlangan holatda bo'ladi:



Gidrolizning protolitik shakli

Mis (II) ning ammiak, aminokislotalar, ko'p atomli spirtlar bilan kompleks birikmalari



Cu (II) ning oqsillar va peptidlar, shu bilan birga biuret ($\text{NH}_2\text{--CO--NH--CO--NH}_2$) bilan ishqoriy sharoitda birikib ko'k-fiolet rangni kompleks birikmalarni hosil qilishi, peptid bog'larni mavjudligini asoslashda qo'llaniladi. Cu (II) ning biuret va oqsillar bilan reaksiyalari biuretli reaksiyalar deyiladi.

Kumush

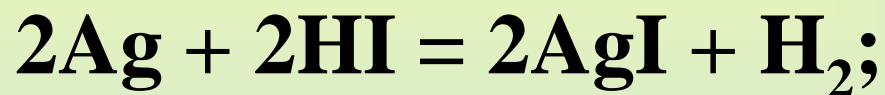
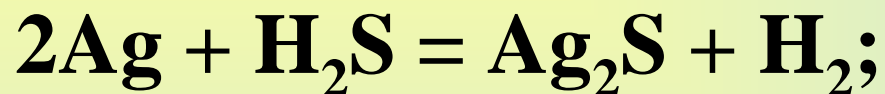
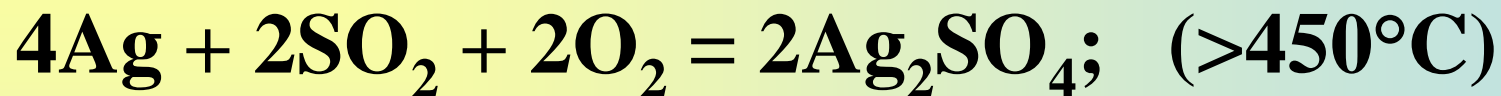
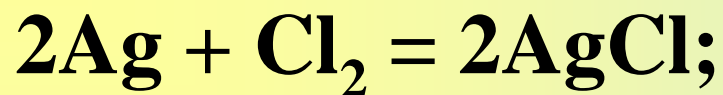
Kumush Ag – yaltiroq xarakterli og'ir plastik metal,

$$T_{\text{suyul}} = 962^{\circ}\text{C},$$

Metallar orasida nisbatan katta elektr - va issiqlik o'tkazuvchanlikka ega, ko'pgina metallar bilan qotishmalar hosil qiladi.

Kimyoviy xossalari

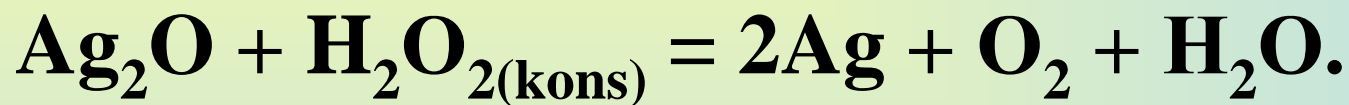
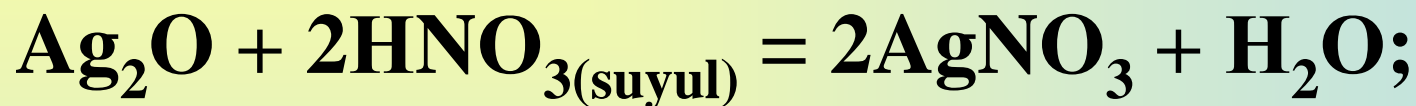
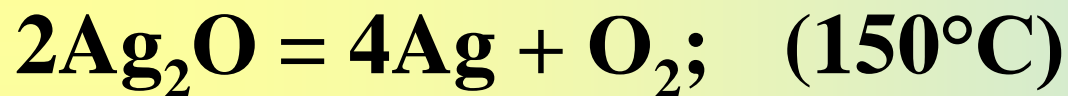
Faolmas (asl) metal hisoblanadi, to'g'ridan-to'g'ri O_2 bilan reaksiyaga kirishmaydi, suyultirilgan kislotalar HCl , H_2SO_4 eritmaları bilan ham reaksiyaga kirishmaydi



Ag₂O kumush oksidi – to'q qo'ng'ir rangli,
qattiq modda,

➤ **Qizdirilganda parchalanadi, asosli xossani
namoyon qiladi,**

➤ **HCl va H₂SO₄ larda yuzasida tuzlar AgCl va
Ag₂SO₄ hosil bo'lganligi sababli yomon eriydi**

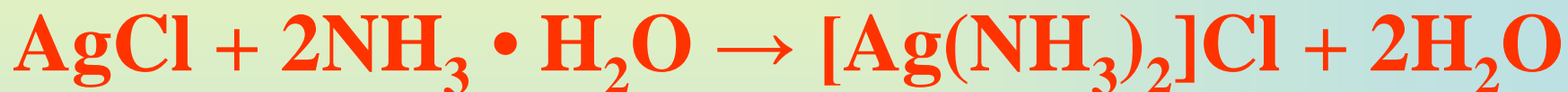
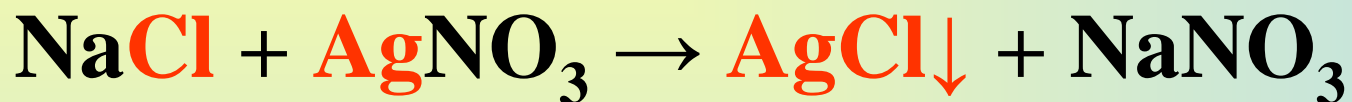
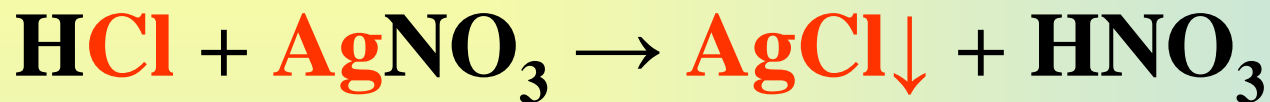


Kumush tuzlari.

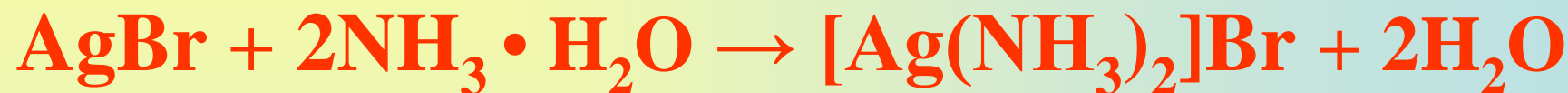
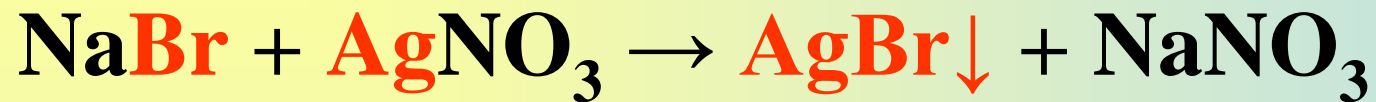
➤ **Quyidagilardan AgF , AgNO_3 , AgClO_3 , AgClO_4 tashqari kumushning hamma tuzlari suvda erimaydi.**

➤ **Ammoniy gidrooksidi, natriy tiosulfat, ammoniy karbonat bilan o'zaro ta'siri (galogenedlarga sifat reaksiyalarini takrorlang).**

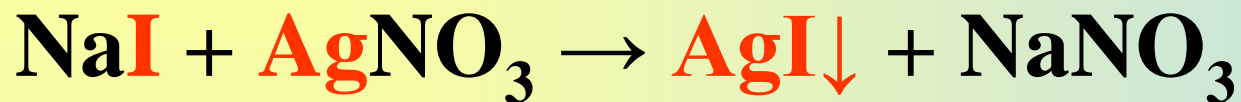
Xlorid-ioniga sifat reaksiyalari:



Bromid - ioniga sifat reaksiyalari:



Yodid-ioniga sifat reaksiyalari:



Farmasevtika tahlilida dabolovchi vositalar sifatida kumush birikmalarini qo'llanilishini kimyoviy asoslari

➤ Boshqa og'ir elementlar – metallar kabi kumushning eruvchan tuzlarini ko'p miqdorda organizmga kelib tushishi og'ir zaharlanishga olib keladi.

Bunda qoidaga ko'ra, kumush oqsildagi oltingugurt atomlari bilan bog'lanadi. Uning natijasida mos fermentlar inaktivlashadi, oqsillar o'ralib qoladi (свертываются).

➤ Suvning tarkibida 10^{-8} mmol/l gacha kumushning bo'lishi uning bakterosidligini oshiradi, bu albuminatlarning hosil bo'lishi bilan tushuntiriladi.

➤ Kumushning bakterosidlik ta'sirining samaradorligi xlor, xlor ohaki, karbol kislotalarnikiga nisbatan birmuncha yuqori.

Oltin Au –

➤ **sariq, bolg'alanuchan, og'ir metal,**

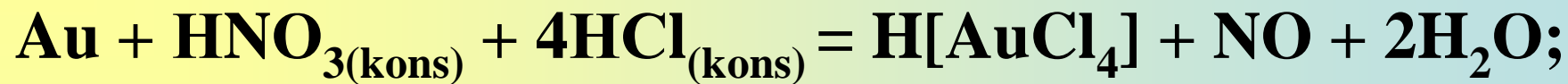
➤ **$T_{\text{suyuq}} = 1064^{\circ}\text{C},$**

➤ **asl metal.**

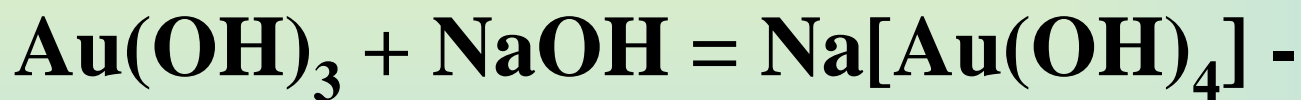
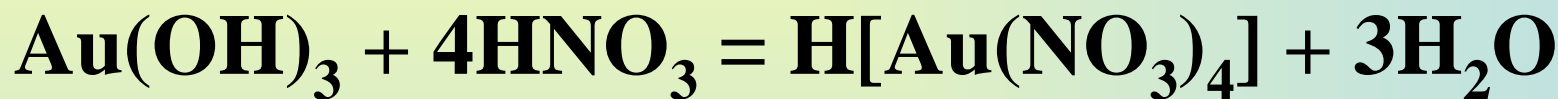
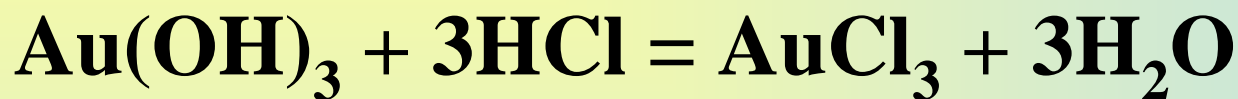
**Tabiatda tarqalishi. Toza metal ko'rinishida
uchraydi**

Kimyoviy xossalari

- **Suv, kislotalar, ishqorlar, kislorod, azot, uglerod, oltingugurt bilan ta'sirlashmaydi,**
- **“shoh arog'i“ bilan eritmaga o'tkaziladi,**
- **simob bilan amalgamma hosil qiladi,**
- **qizdirilganda galogenlar bilan o'zaro ta'sirlashadi.**



Oltin (III) oksidi va gidroksidi suvda erimaydi,
amfoterlik xossasini namoyon qiladi:

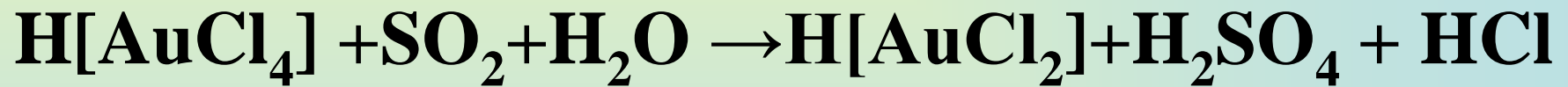


gidroksoaurat (III)

Au (III) birikmalari oksidlovchilik xossalarini

namoyon qiladi:

Koeffitsiyentlar tanlang:



Koeffisiyentlar tanlang:

