

## 2-LABORATORIYA ISHI.

### MAVZU: NOORGANIK BIRIKMALARNING ENG MUHIM SINFLARI. OKSIDLAR VA ASOSLAR ULARNING OLINISH VA XOSSALARI.

#### Ishning maqsadi:

Anorganik moddalarning asosiy sinflari bo'lgan oksidlar, asoslarning xossalari tajribalar asosida o'rganish. Talabalarda tajribalarni to'liq va to'g'ri bajarishi, kuzatishlardan to'g'ri xulosa chiqarishni, jihozlarini to'g'ri qo'llay olish malaka va ko'nikmalarini hosil qilish.

#### Kerakli asbob va jihozlar:

1. Probirkalar
2. kimyoviy o'lchov shisha stakanlar
3. tubi yassi kolba
4. elektron tarozi
5. shisha tayokcha
6. Pipetka
7. Qiskich
8. Pichok
9. Perchatka
10. Shpate
11. petri kosachasi
12. filtr kogoz.

#### Kerakli kimyoviy reaktivlar:

Natriy metali, kalsiy metali, mis oksidi, temir (3)xlorid eritmasi, mis(2)xlorid eritmasi, kurgshin(2)nitrat eritmasi, natriy gidroksid eritmasi, alyuminiy (3)xlorid eritmasi, rux sulfat eritmasi, suv, indikatorlar (lakmus, fenolftalien, metiloranj).

### ISHNING NAZARIY ASOSI

Elementlarning kislorod bilan hosil qilgan birikmalari **oksidlar** deyiladi. Oksidlarda kislorod bilan birikkan element doimo musbat, kislorod esa manfiy ikki oksidlanishdarajasida bo'ladi ( $F_2O$  dan boshqa birikmalarda). Oksidlar kimyoviy xossalari ga ko'rato'rt guruhga bo'linadi: 1) asosli oksidlar; 2) kislotali oksidlar; 3) amfoter oksidlar; 4) tuzhosil qilmaydigan oksidlar (masalan, NO va CO tuz hosil qilmaydi). Ko'pincha bu oksidlarni betaraf (indiferent) oksidlar ham deyiladi, lekin bu to'g'ri emas, chunki ular ham kimyoviy reaksiyaga kirishadi va birikma hosil qiladi.

**Asoslar deb** – metal atomi va bir yoki bir nechta gidrokso guruhdan tashkil topgan murakkab moddalar.

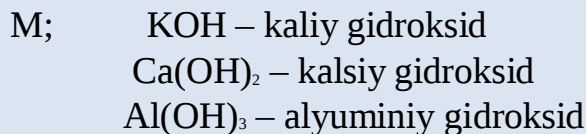
Umumiy formulasi  $Me(OH)_n$

Bu yerda; Me – metal n – metal valentligi

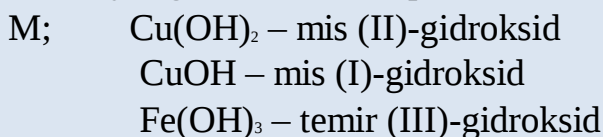
#### Asoslarning nomlanishi.

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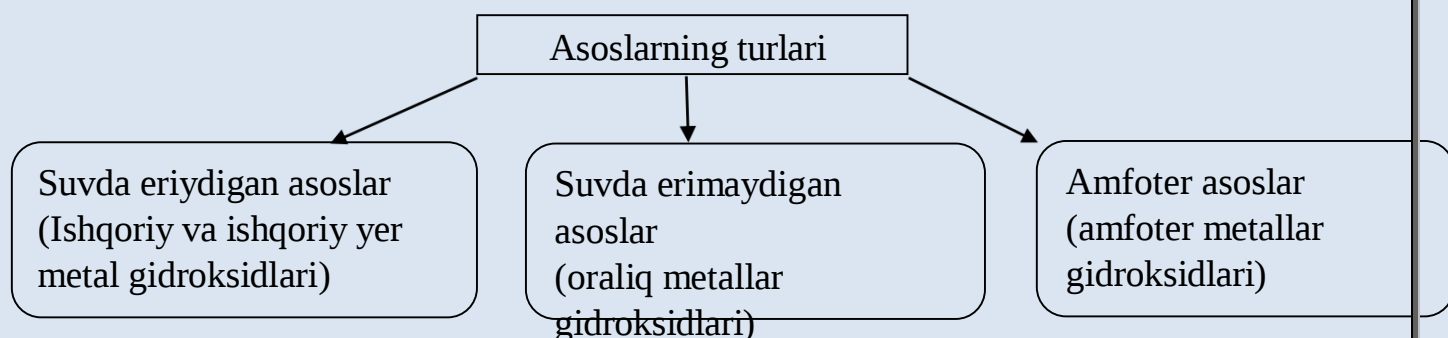
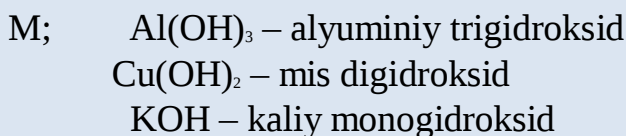
1) o'zgarmas valentli metallarda metal nomiga gidrokso guruh qo'shib nomlanadi.



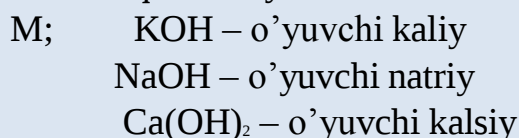
2) o'zgaruvchan valentli metallar uchun metal nomidan keyin metal valentligi rim raqamida qavs ichida keyin gidroksid so'zi qo'shib nomlanadi.



3) metal nomiga gidrokso guruh sonini grekcha sonlarda ifodalanishini qo'shib ham nomlash mumkin.



Suvda eriydigan asoslar kuchli teriga tegsa terini kuydirish (o'yish) xususiyatiga ega shuning uchun o'yuvchi ishqorlar deyiladi.



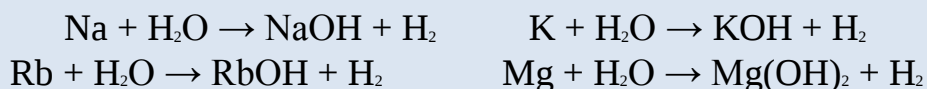
**Amfoter gidroksidlar** – ham kislota ham asos hossasiga ega bo'lgan gidroksidlar.

Bularga;      Al(OH)<sub>3</sub>, Zn(OH)<sub>2</sub>, Be(OH)<sub>2</sub>, Cr(OH)<sub>3</sub>, Fe(OH)<sub>3</sub>

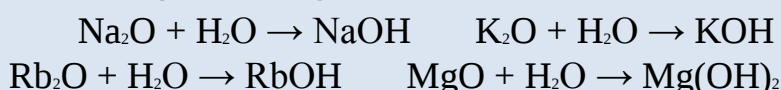
### Asoslarni olinishi.

+ Suvda eriydigan asoslarning olinishi

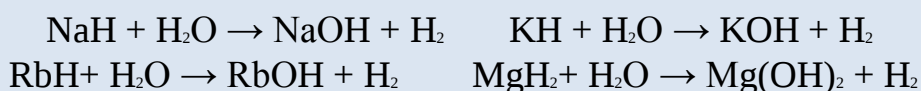
+ Aktiv metallarga suvni ta'sir ettirib



+ Aktiv metallarning oksidlariga suvni ta'sir ettirib



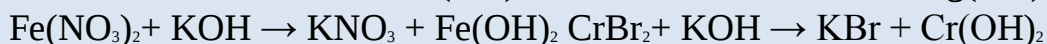
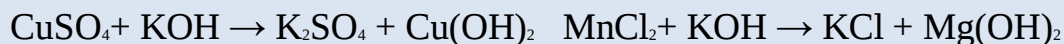
+ Aktiv metallarning gidridlariga suvni ta'sir ettirib



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➤ Suvda erimaydigan va amfoter asoslarning olinishi:

+ Metallarning tuzlariga ishqorlarni ta'sir ettirib.



### Asoslarning xossalari.

Fizik xossalari – asoslar turli ranga ega bo'ladi.

M;  $\text{KOH}, \text{NaOH}, \text{Ca(OH)}_2$  – oq rangli

$\text{Ni(OH)}_2$  – yashil rangli

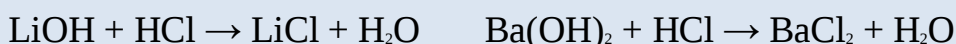
$\text{Fe(OH)}_3$  – qo'ng'ir rangli

$\text{Cu(OH)}_2$  – havorang rangli

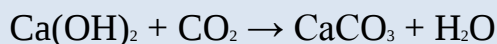
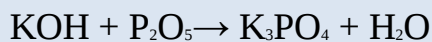
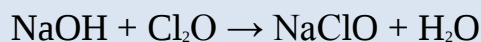
$\text{CuOH}$  – sariq rangli.

### Kimyoviy hossalari.

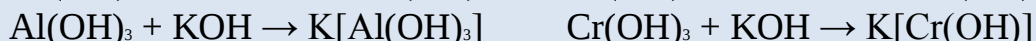
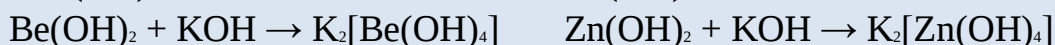
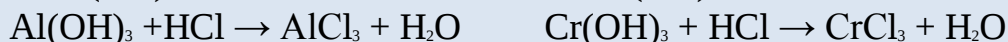
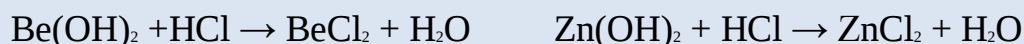
+ Asoslarga kislotalarning ta'siri:



+ Asoslarga kislotali oksidlarning ta'siri:

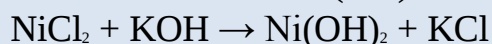
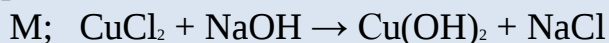


+ Amfoter asoslarga kislota va ishqorlarning tasiri:

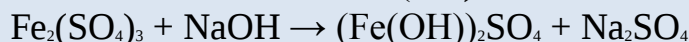
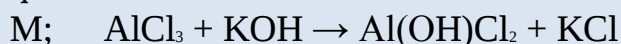


+ Ishqorlar tuzlar bilan reaksiyaga kirishib yangi tuz va yangi asos hosil qiladi. (sharoitga qarab o'rta yoki asosli tuz hosil qiladi)

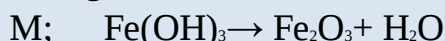
a) ishqor ko'p bo'lsa o'rta tuz hosil bo'ladi.



b) ishqor kam bo'lsa asosli va o'rta tuz hosil bo'ladi.



5) asoslar qizdirilganda metal oksid va suv hosil qiladi.



**TAJRIBALAR**

## **2-labaratoriya ishi: Anorganik birikmalarning eng muhim sinflari: Oksid va asoslar**

### **1- Tajriba : Metallarga suv bilan tasir etib gidroksid xosil kilish.**

- ❖ 1.Kichkina kristallizatorning yarmigacha suv kuying.
- ❖ 2.Kerosin ostidan Na metalining bir bulagini kiskich bilan oling.
- ❖ 3.Na metali bulagini filtr kogos bilan kuriting.
- ❖ 4.Na bo'lakdan pichok yordamida kesib (nuxot kattaligidek) bulakcha oling,kolgan bulagini kerosinli idishga soling.
- ❖ 5.Olingan bulakchanning kesilgan kismiga karang metallning fizikaviy xossalariga etibor bering kuzatishlaringizni daftarga kayd eting.
- ❖ 6.Natiriy bulakchasini filtr kogoschaga urab suvga soling.Kuzatishlaringizni va reaksiya tenglamasini daftarga yozing.
- ❖ 7.Xosil bulgan ishkor eritmasini shisha tayokcha bilan aralashtiring, natriy gidroksidning suvdv erishiga ishonch xosil kiling.
- ❖ 8.NaOH eritmasini 3 ta probirkaga soling 1-chisiga- lakmus,2-chisiga fenolftalien,3-chisiga metiloranj solib rang uzgarishlarini kuzating va daftarga kayd eting.

### **№2 Tajriba: metal oksidlariga suv ta'sir ettirib:**

- ❖ 1.Ikkita kristallizator oling,yarmigacha suv kuying.
- ❖ 2.Birinchi kristallizatorga ozrok, CaO soling va jarayonni kuzating,kuzatuvlaringizni daftarga kayd eting.
- ❖ 3.Xosil bulgan eritmani «lakmus» bilan tekshirib kuringva xulosalang.Kimyoviy reaksiya tenglamasini yozig.
- ❖ 4.Ikkinchi kristallizatorga CuO dan ozrok soling jarayonni kuzating.kuzatuvlaringizni daftarga kayd eting.Lakmus bilan tekshiring va xulosalang.

### **№3 Tajriba: Suvda oz eriydigan asoslarning olinishi.**

- ❖ 1.Uchta probirka oling (r-9probirka).
- ❖ 2 .a)1-probirkaga 5-10ml temir (3)xlodid eritmasidan sling.
- ❖ b).2-probirkaga 5-10ml mis(2) xlodid eritmasidan soling.
- ❖ v).3-probirkaga 5-10ml kurgoshin (2)nitrat eritmasidan kuying.
- ❖ 3.Xar bir probirkaga tomchilatib ishkor natriy gidroksid eritmasidan kuying.
- ❖ 4.Jarayonni kuzating. Natijalarni kuzatuv daftaringizga yozing.
- ❖ 5.Kimyoviy reaksiya tenglamalarni:
- ❖ molekulyar
- ❖ ionli
- ❖ v) kiskartirilgan ionli tenglamalarini yozing.
- ❖ 6.Xulosalang.

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### **№4 Tajriba: Amfoter gidroksidlarni xosil kilish**

- ❖ Ikkita probirka oling (r-9 probirka)
- ❖ a) 1-probirkaga alyuminiy (3)xlorid eritmasidan 5-10 ml soing.
- ❖ b) 2-probirkaga rux sulfat eritmasidan 5-10ml soling.
  - ❖ 3.1-probirkaning ustiga chukma xosil bulguncha natriy gidroksid eritmasidan tomchilatib kuying.
- ❖ 4.Jarayonni kuzating va natijalarni kuzatuv daftaringizga yozing.Kimyoviy reaksiya tenglamalarini : a) molekulyar b) ionli v) kiskartirilgan ionli tenglamasini yozing.
- ❖ 5.SHu jarayonni rux sulfat solingan probirka bilan xam amalga oshiring.Xulosalang va kimyoviy reaksiya tenglamalarini yozing.
- ❖ 6.Ikkala probirdagi chukmani 2- ga buling.Buning uchun chukmani shisha tayokcha bilan aralashtirib chaykating va yarmini 2-chi bush probirkaga kuying. Bu amalni 2-ta probirkadagi chukma uun xam bajaring.
- ❖ 7.CHukma probirka tagiga chukkuncha kuting.
- ❖ alyuminiy (3)gidroksid solingan 1-chi probirkaga sulfat kislota eritmasidan
  - chukma erib ketguncha tomchilatib soling, xar tomchidan sung probirkani chaykating va jarayonni kuzating.
- ❖ 8.Reaksiya tenglamasini :
- ❖ a) molekulyar b) tula ionli v) kiskartirilgan ionli tenglamalarini yozing.
  - ❖ 9. Alyuminiy (3)gidroksid solingan 2-chi probirkaga natriy gidroksid eritmasidan tomchilatib soling (kuprok),aralashtiring va jarayonni kuzating.
- ❖ 10.Reaksiya tenglamasini :
- ❖ a) molekulyar b) to'la ionli v) qiskartirilgan ionli tenglamalarini yozing.
  - ❖ 11.Alyuminiy (3)gidroksidning amfoter xossaga ega ekanligiga ishonch xosil kiling. Xulosalang.
- ❖ 12.Olingan rux gidroksid bilan xam yukoridagi ishlarning ketma-ketligini bajaring.Reaksiya tenglamalarini yozing,xulosalang.

### **Savol va topshiriqlar**

- 1.Amfoter xossaga ega bo'lgan moddalarni molekulyar,qisqartirilgan,ionli tenglamalarini yozing?
- 2. Metall oksidlariga misollar yozing?
- 3.Amfoter gidroksidlarni olinishini reaksiya tenglamalarini yozing?