

Metallarning

umumiy

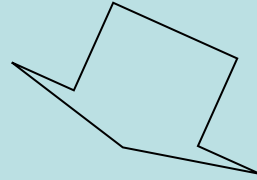
xossalari

Muallif: Q. O'. Komilov

# *Reja:*

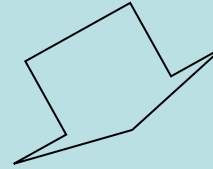
- Metallarning fizik xossalari*
- Rudalardan metallarni olish usullari*
- Metallarning kimyoviy xossalri*
- Metallarning xalq xo'jaligidagi ahamiyati*

# Modda



**Oddiy**

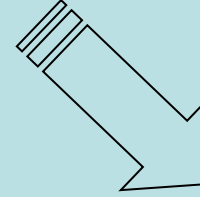
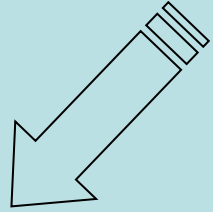
Bir turdagi atomlardan  
tashkil topgan



**Murakkab**

Turli turdagi atomlardan  
tashkil topgan

# Oddiy moddalar



**Metallar**

Metal bog'li oddiy  
moddalar hosil qiluvchi  
rimyoviy elementlar

**Metalmaslar**

Metallarning fizik-  
kimyoviy xossalariga  
ega bo'lmagan oddiy  
moddalar hosil qiluvchi  
kimyoviy elementlar

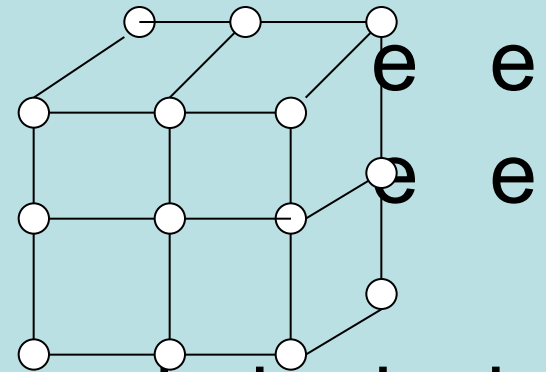
- Qadimda va o'rta asirlarda 7 ta metal ma'lum bo'lgan (Au, Ag, Cu, Pb, Fe, Hg)
- M.V.Lomonosovning fikricha - metallar "rangli jismlar bo'lib, ularni eritish, quyish va bolg'lash mumkin"
- A. Lavuaz'yi – 1789 yilda 17 ta metalni asoslab berdi
- D. I. Mendiliyev – metallarni bashoratlagan
- XIX asrda – platina qatori, ishqoriy va ishqoriy-yir metallari ochilgan.
- XX asrda – trans uran elementlari ochilgan.

# Metallarni tabiatda tarqalishi

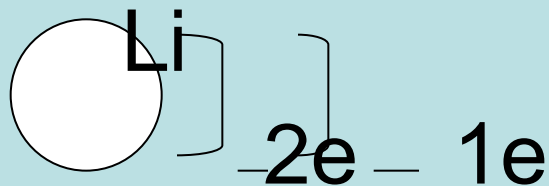
- Birikmalar ko'rinishida;
- Alohida holatda (Au, Pt, Ag);
- Tuzlar ko'rinishida (galogenidlar, karbonatlar, nitratlar, fosfatlar);
- Oksidlar va sulfidlar ko'rinishida;

# Metallar .....

- Metal kristal panjarasiga.



- Tashqi qavatida nisbatan kam miqdordagi elektronlarga ega:



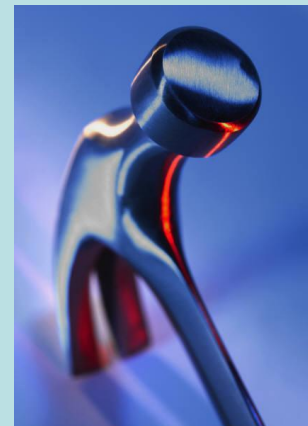
- Ozod valent elektronlarga ega;
- Metal bog'lanish yunaluvchanlik va to'yinuvchanlikga ega emas;
- Xarakatchan ionlar, musbat zaryadlangan ionlar o'rtasida elektrik itarilishni kompensasiyalaydi va shu bilan ularni qattiq jismlarga bog'laydi.



# Metallarning fizikaviy hossalari

- Simobdan tashqari.

(eng yumshoq – kaliy,  
Eng qattiq – xrom)



- Qovushqoqlik



- Au, Ag, Cu, Sn, Pb, Zn, Fe  
kamayadi

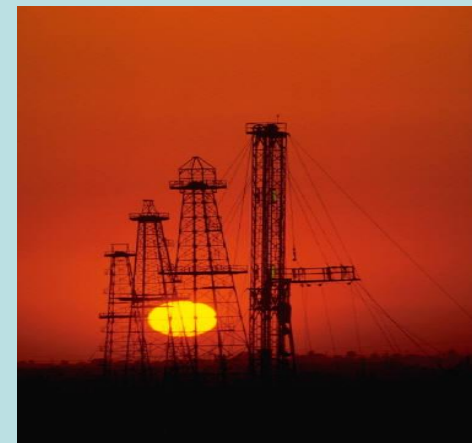


- Issiqliklik o'tkazuvchanligi

Hg, Cu, Ag, Al, Fe  
Qatorda kamayadi

- 
- Elektr o'tkazuvchanligi

Ag Mn  
→  
kamayadi



# Erish harorati

Oson eruchan

Hg, Ga, Cs, In, Bi



Qiyin eruvchan

W, Mo, V, Cr

Zichligi

Yingil

Og'ir

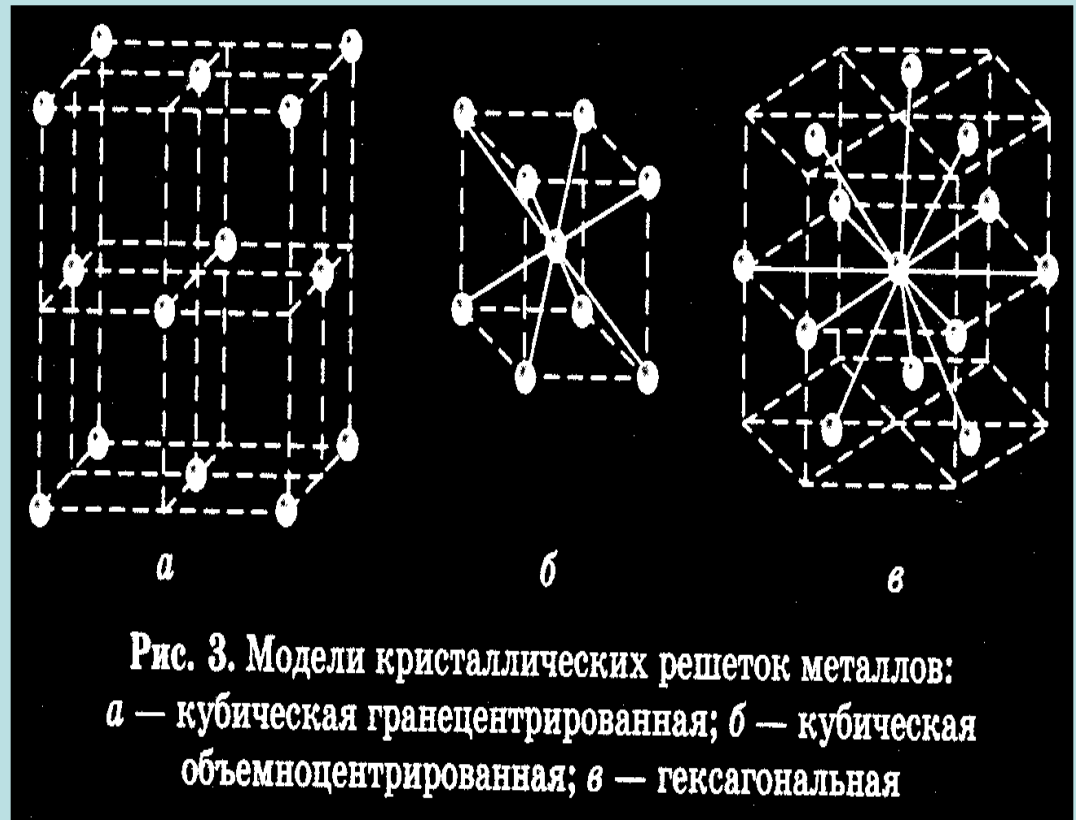
(Li–eng yingil, K,Na,Mg; (Osmiy – eng og'r, Ig, Pb)

- Metallik yaltirog'ga ega



# Metallarni fizikaviy xossalari farqlanishiga olib keluvchi sabablar

- Metal atomlari turli tipdagi kristal panjaralar hosil qiladi



# Metallarni fizikaviy xossalari farqlanishiga olib keluvchi sabablar

- Metal atomlari, metal bog'lar hosil bo'lishida har xil valent elektronlarga ega СВЯЗИ
- Atomlar (ionlar) turli radiuslarga ega
- Qo'shimcha guruhcha metallari atomlari juftlashmagan d-elektronlar hisobiga kovalent bog' xam hosil qilishi mumkin.



# Elementlar davriy jadvalida elementlarning holati

	I	II	III	IV	V	VI	VII	VIII	0		
1	H 1 1766								He 2 1895		
2	Li 3 1817	Be 4 1798	B 5 1808	C 6 ???	N 7 1772	O 8 1774	F 9 1886		Ne 10 1898		
3	Na 11 1807	Mg 12 1808	Al 13 1825	Si 14 1824	P 15 1669	S 16 ???	Cl 17 1774		Ar 18 1894		
4	K 19 1807	Ca 20 1808	Sc 21 1879	Ti 22 1791	V 23 1830	Cr 24 1797	Mn 25 1774	Fe 26 ???	Co 27 1739	Ni 28 1751	
5	Cu 29 ???	Zn 30 ???	Ga 31 1875	Ge 32 1886	As 33 ???	Se 34 1818	Br 35 1826			Kr 36 1898	
6	Rb 37 1861	Sr 38 1790	Y 39 1789	Zr 40 1789	Nb 41 1801	Mo 42 1778	Tc 43 1937	Ru 44 1844	Rh 45 1803	Pd 46 1803	
7	Ag 47 ???	Cd 48 1817	In 49 1863	Sn 50 ???	Sb 51 ???	Te 52 1782	I 53 1811			Xe 54 1898	
8	Cs 55 1860	Ba 56 1808	La 57 1839	Hf 72 1923	Ta 73 1802	W 74 1783	Re 75 1925	Os 76 1804	Ir 77 1804	Pt 78 1735	
9	Au 79 ???	Hg 80 ???	Tl 81 1861	Pb 82 ???	Bi 83 ???	Po 84 1898	At 85 1940			Rn 86 1898	
10	Fr 87 1939	Ra 88 1898	Ac 89 1899	Rf 104 1969	Db 105 1970	Sg 106 1974	Bh 107 1976	Hs 108 1984	Mt 109 1982	Uun 110 1994	Uuu 111 1994

*Лантаноиды и Actиноиды*

л	Ce 58 Неzare...	Pr 59 Неzare...	Nd 60 Неzare...	Pm 61 Неzare...	Sm 62 Неzare...	Eu 63 Неzare...	Gd 64 Неzare...	Tb 65 Неzare...	Dy 66 Неzare...	Ho 67 Неzare...	Er 68 Неzare...	Tm 69 Неzare...	Yb 70 Неzare...	Lu 71 Неzare...
А	Th 90 Неzare...	Pa 91 Неzare...	U 92 Неzare...	Np 93 Неzare...	Pu 94 Неzare...	Am 95 Неzare...	Cm 96 Неzare...	Bk 97 Неzare...	Cf 98 Неzare...	Es 99 Неzare...	Fm 100 Неzare...	Md 101 Неzare...	No 102 Неzare...	Lr 103 Неzare...

# Topishmoqli qo'shnilar



Li <sup>3</sup> Литий
Na <sup>11</sup> Натрий
K <sup>19</sup> Калий
Rb <sup>37</sup> Руби...
Cs <sup>55</sup> Цезий
Fr <sup>87</sup> Фран...

Be <sup>4</sup> Бери...
Mg <sup>12</sup> Магн...
Ca <sup>20</sup> Каль...
Sr <sup>38</sup> Стро...
Ba <sup>56</sup> Барий
Ra <sup>88</sup> Радий

Sc <sup>21</sup> Скан...	Ti <sup>22</sup> Титан	V <sup>23</sup> Вана...	Cr <sup>24</sup> Хром	Mn <sup>25</sup> Марг...	Fe <sup>26</sup> Железо	Co <sup>27</sup> Коба...	Ni <sup>28</sup> Никель	Cu <sup>29</sup> Медь	Zn <sup>30</sup> Цинк
Y <sup>39</sup> Иттрий	Zr <sup>40</sup> Цирк...	Nb <sup>41</sup> Ниоб...	Mo <sup>42</sup> Моли...	Tc <sup>43</sup> Техне...	Ru <sup>44</sup> Рутен...	Rh <sup>45</sup> Родий	Pd <sup>46</sup> Палл...	Ag <sup>47</sup> Сере...	Cd <sup>48</sup> Кадм...
La <sup>57</sup> Лантан	Hf <sup>72</sup> Гафний	Ta <sup>73</sup> Тантал	W <sup>74</sup> Воль...	Re <sup>75</sup> Рений	Os <sup>76</sup> Осмий	Ir <sup>77</sup> Ирид...	Pt <sup>78</sup> Плат...	Au <sup>79</sup> Золото	Hg <sup>80</sup> Ртуть
Ac <sup>89</sup> Акти...	Rf <sup>104</sup> Резер...	Db <sup>105</sup> Дубн...	Sg <sup>106</sup> Сибо...	Bh <sup>107</sup> Борий	Hs <sup>108</sup> Хассий	Mt <sup>109</sup> Мейт...	Uun <sup>110</sup> Ун-у...	Uuu <sup>111</sup> Ун-у...	

✚ *Ishqoriy metallar*

✚ *Ishqoriy - yir metallari*

✚ *Oraliq metallar*

# Metallarning kimyoviy xossalari

- Metallar kimyoviy reaksiyalarda qaytaruvchi hisoblanadi, lekin o'zi oksidlanadi

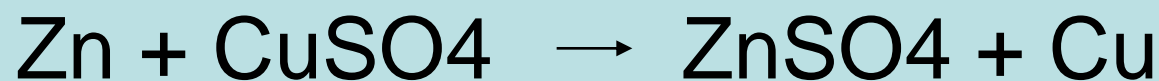


Al, Be, Mg, Ca, Li, Na, K, Rb, Cs



Ushbu qatorda metallarning qaytaruvchilik qobiliyati ortadi

- Metallar birikmalardan boshqa metallar bilan siqib chiqariladi

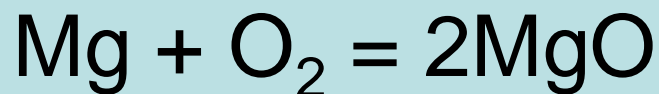
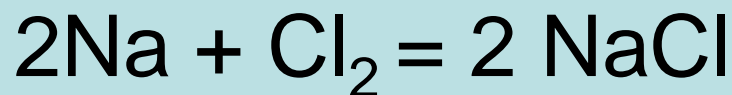


- N.N. Beketov tomonidan – metallarning «siqib chiqaruvchanlik qatorini» tuzilgan
- (bu - metallarning elektro-kimyoviy kuchlanishlar qatorining prototipidir)

Li, K, Ca, Na, Mg, Al, Mn, Zn, Cr, Fe, Ni, Sn, Pb, Cu, Hg, Ag, Pt, Au.

## Metallar oddiy moddalar bilan reaksiyaga kirishadi:

- Galogenlar va kislorod bilan

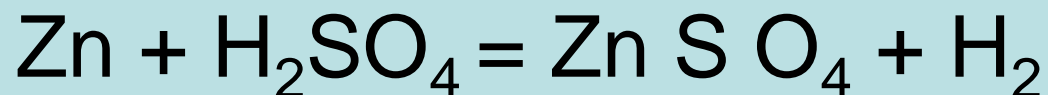


- V – guruh asosiy guruhcha elementlari bilan (qiyin)

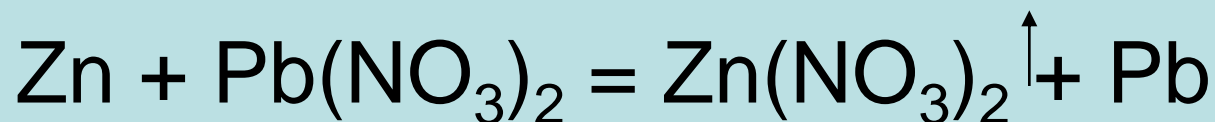


# Metallar murakkab moddalar bilan reaksiyga kirishadi

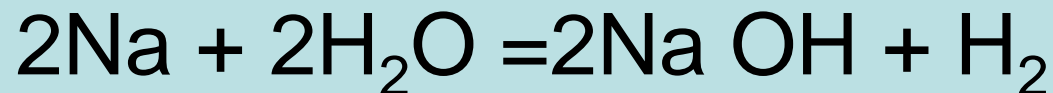
## - Kislotalar bilan



## - Tuzlar bilan



## - Suv bilan (faol)



# Metallarning qo'llanilishi

Tibbi-  
yot

Uskuna  
-sozlik

Qishloq  
xo'jaligi

Metallurgiy  
sanoati



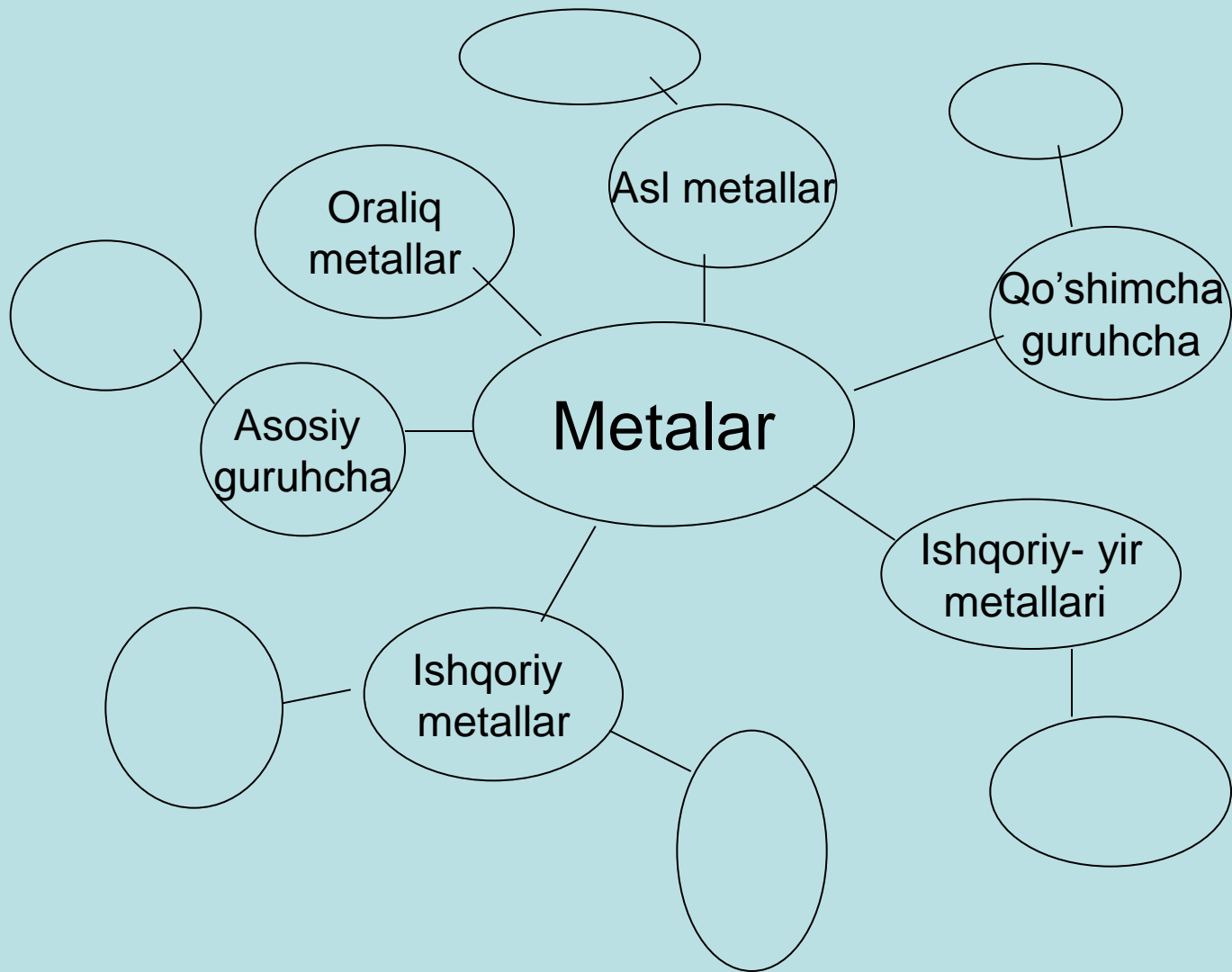
Qotishmal  
-ar olishda

Uy  
xo'jaligida

# Metallarning olinishi

- Pirometallurgiya usulida – uglerod (C), uglerod (II) – oksid, vodorod bilan yuqori haroratda qaytarish.
- Allyuminotermiy usulida-
- Hidrometallurgik usul bilan – rudadan nisbatan faol usul bilan va eritmadan olish
- Elektroliz – c suyqlanma va eritmalaridan elektr toki yordamida





# Toifalash jadvali

Ishqoriy va ishqoriy – yir metallari	Asl metallar	Oraliq metallar

# B/B/B jadvali

Bilaman	Bilishni xoxlayman	Bilib oldim

E'tiboringiz uchun raxmat