

QATTIQ MODDALARNING TUZILISHI VA ULARDAGI ASOSIY PARAMETRLAR

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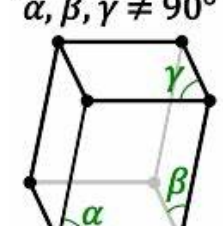
Jizzax davlat pedagogika universiteti akademik litseyi

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Qattiq kristall moddalar 7 sistemaga mansub 14 turdagi kristall panjaralar (O. Bravais) turlari va zarralar joylashuvining 230 qonuni (E.S. Fedorov) mavjud.

1. Triklinik
2. Monoklinik
3. Ortorombik
4. Tetragonal
5. Kub
6. Trigonal
7. Geksogonal

1. Triklinik - Uchta o'lchami har xil, barcha burchaklar $\neq 90^\circ$, uning bitta turti bor.

 $\alpha, \beta, \gamma \neq 90^\circ$	Δ P -oddiy triklinik: (atomlar faqat parallelepipedning burchaklarida): $a \neq b \neq c$, $\alpha \neq \beta \neq \gamma \neq 90^\circ$. Misol: $K_2Cr_2O_7$, $CuSO_4 \cdot 5H_2O$, H_3BO_3. Δ Elementar yachykadagi atmlar soni: $8 \times 1/8 = 1$ ta.
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2. Monoklinik - Ikki burchagi 90° , uchinchi $\neq 90^\circ$, uning ikkita turti bor.

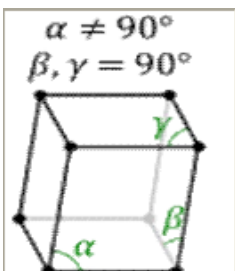
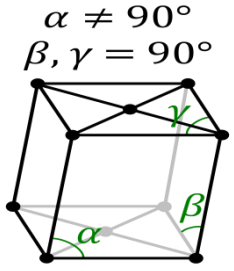
Δ P -oddiy monoklinik: (atomlar faqat parallelepipedning burchaklarida):	Δ C –asosi markazlashgan monoklinik: bu ikki asosning markazida qo'shimcha atom bor:
Misol: monoklinik oltingugurt.	Misol: $Na_2SO_4 \cdot 10H_2O$.
• Elementar yachykadagi atmlar soni: $8 \times 1/8 = 1$ ta.	• Elementar yachykadagi atmlar soni: $8 \times 1/8 + 2 \times 1/2 = 2$ ta.

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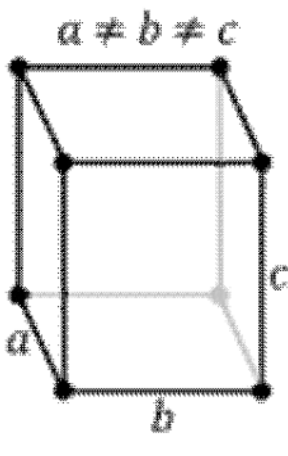
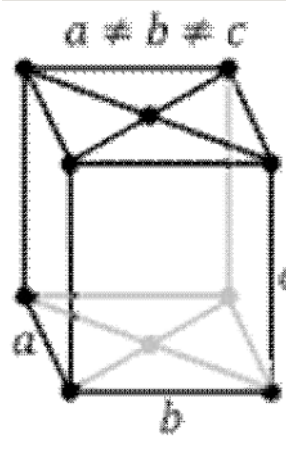
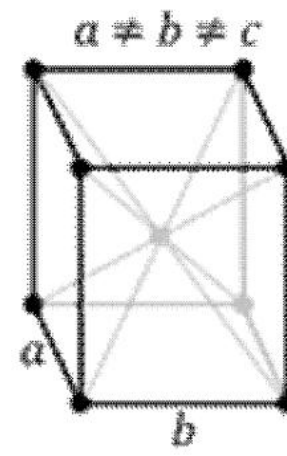
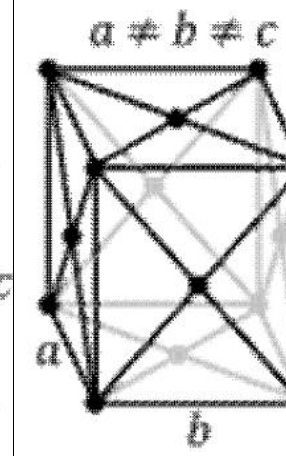
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$a \neq b \neq c, \alpha \neq 90^\circ = \beta = \gamma$.	$a \neq b \neq c, \alpha \neq 90^\circ = \beta = \gamma$.
	

3. Ortorombik - Uch o'lchami har xil va barcha burchaklar 90° . $a \neq b \neq c$, $\alpha = \beta = \gamma = 90^\circ$. To'rtta turi bor.

P-Oddiy ortorombik(atomlar faqat parallelepipedning burchaklarida joylashgan)	C- asosi markazlashgan ortorombik (uning asos markazida qo'shimcha 2ta atom mavjud)	I - hajmi markazlashgan ortorombik (elementar yacheyka markazida 1ta atom joylahgan).	F – yoqlari markazlashgan ortorombik (6 ta yoqlarida markazida 6 ta atom joylashgan)
Misol: Rombik oltingugurt	KNO ₃	CaCO ₃	BaSO ₄
Elementar yachykadagi atmlar soni: $8 \times 1/8 = 1$ ta	Elementar yachykadagi atmlar soni: $8 \times 1/8 + 2 \times 1/2 = 2$ ta.	Elementar yachykadagi atmlar soni: $8 \times 1/8 + 1 = 2$ ta	Elementar yachykadagi atmlar soni: $8 \times 1/8 + 6 \times 1/2 = 4$ ta
			

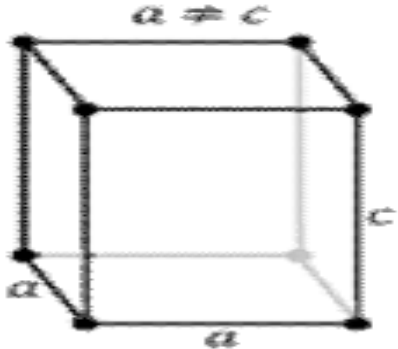
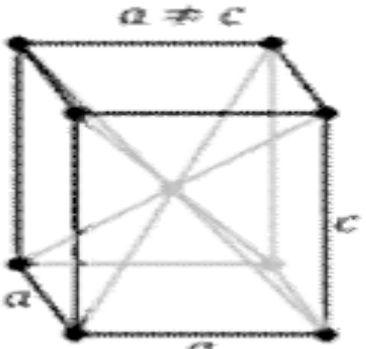
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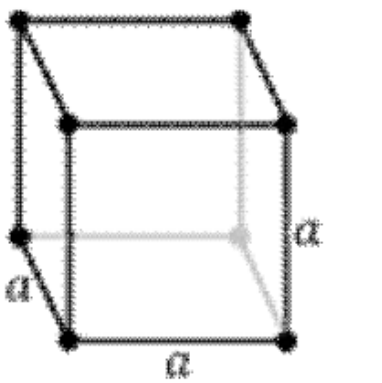
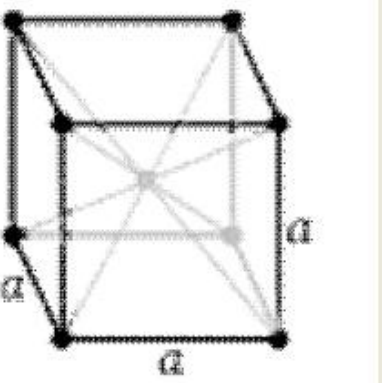
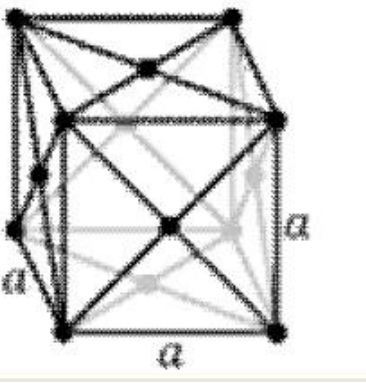
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4. Tetragonal - Kubga o'xshash, lekin bir o'lchami boshqacha (cho'zilgan yoki siqilgan kub). $a = b \neq c$, $\alpha = \beta = \gamma = 90^\circ$. 2 ta turi bor.

P-Oddiy ortorombik(atomlar faqat parallelepipedning burchaklarida joylashgan)	I - hajmi markazlashgan ortorombik (elementar yacheyka markazida 1ta atom joylashgan).
Misol: SnO ₂	Misol: TiO ₂ , CaSO ₄
Elementar yachykadagi atmlar soni: $8 \times 1/8 = 1$ ta	Elementar yachykadagi atmlar soni: $8 \times 1/8 + 1 = 2$ ta
	

5. Kub - Kub shaklida. $a = b = c$, $\alpha = \beta = \gamma = 90^\circ$. 3 ta turi bor.

P-Oddiy ortorombik(atomlar faqat parallelepipedning burchaklarida joylashgan)	I - hajmi markazlashgan ortorombik (elementar yacheyka markazida 1ta atom joylashgan).	F – yoqlari markazlashgan ortorombik (6 ta yoqlarida markazida 6 ta atom joylashgan)
Misol: Mis, KCl, NaCl	Olmos, Fe, Cr, W.	Al, Cu, Au.
Elementar yachykadagi atmlar soni: $8 \times 1/8 = 1$ ta	Elementar yachykadagi atmlar soni: $8 \times 1/8 + 1 = 2$ ta	Elementar yachykadagi atmlar soni: $8 \times 1/8 + 6 \times 1/2 = 4$ ta
		

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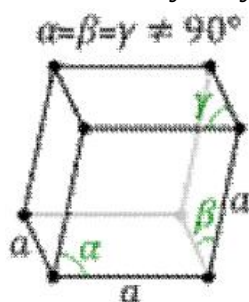
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6. Trigonal - Ikki asos teng, burchaklar teng $\neq 90^\circ$. $a = b = c$, $\alpha = \beta = \gamma \neq 90^\circ$, $< 120^\circ$. 1 ta turi bor.

P-Oddiy ortorombik(atomlar faqat parallelepipedning burchaklarida joylashgan)

Misol:

Elementar yachykadagi atmlar soni: $8 \times 1/8 = 1$ ta

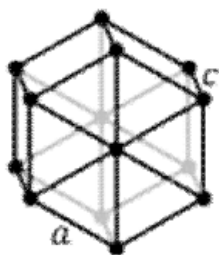


7. Geksogonal - Ikki o'lchami teng, uchinchi o'lchami boshqacha; asosida olti burchak shakl bor. $a = b \neq c$, $\alpha = \beta = 90^\circ$, $\gamma = 120^\circ$. 1 ta turi bor.

P-Oddiy ortorombik(atomlar faqat parallelepipedning burchaklarida joylashgan)

Misol: Grafit, ZnO, Mg, CdS.

Elementar yachykadagi atmlar soni: $6 \times 1/6 + 6 \times 1/6 + 2 \times 1/2 = 3$ ta



	Oddiy kub	Hajmiy markazlash-gan kub	Yoqlari markazlash-gan kub
Panjara qismidagi atomlar soni	1	2	4
KS	6	8	12
Eng yaqin atomgacha masofa	a	$a\sqrt{3}/2 = 0.866a$	$a\sqrt{2}/2 = 0.707a$
Atom radiusi - R	$a/2$	$a\sqrt{3}/4 = 0.433a$	$a\sqrt{2}/4 = 0.354a$
Joylashish ulushi	52.4%	68.0%	74.0%

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► Davriy jadvalda metallarning kristall panjara tuzilishi bo'yicha sinflanishi

1																18
	2															
Li	Be															
Na	Mg	3	4	5	6	7	8	9	10	11	12	Al	Si			
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge			
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb		
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	

Qattiq moddalarning ksirtall tuzilishini bilgan holda uning nazariy zichligini hisoblash mumkin:

$$\rho = \frac{nA}{V_C N_A}$$

bu yerda:

n – har bir panjara birligidagi atomlar soni

A – nisbiy atom massa

VC – panjara birliginining hajmi

NA – Avogadro soni

Adabiyotlar

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