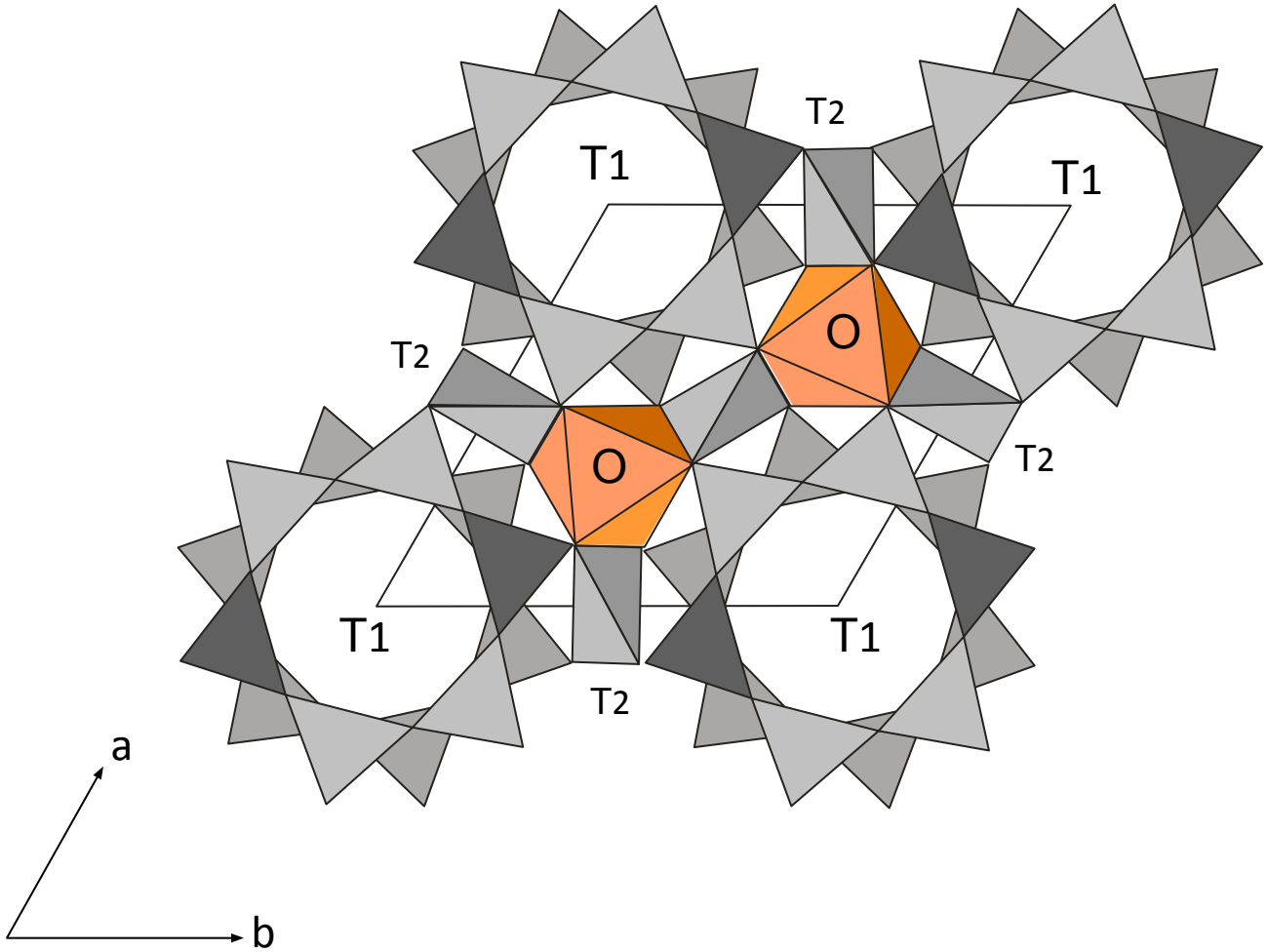
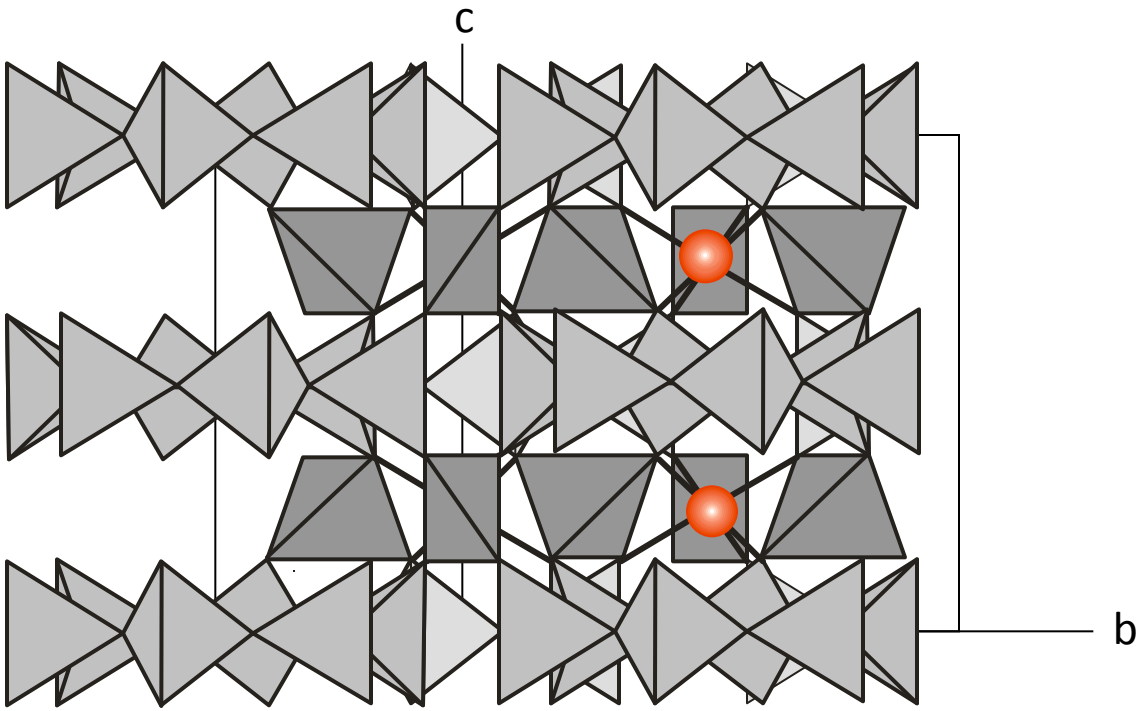
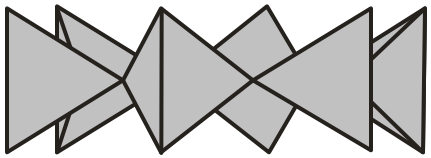
# Структура кордиерита

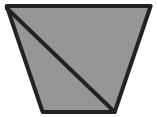


# Структура кордиерита



$[Al_2Si_4O_{18}]^{14-}$

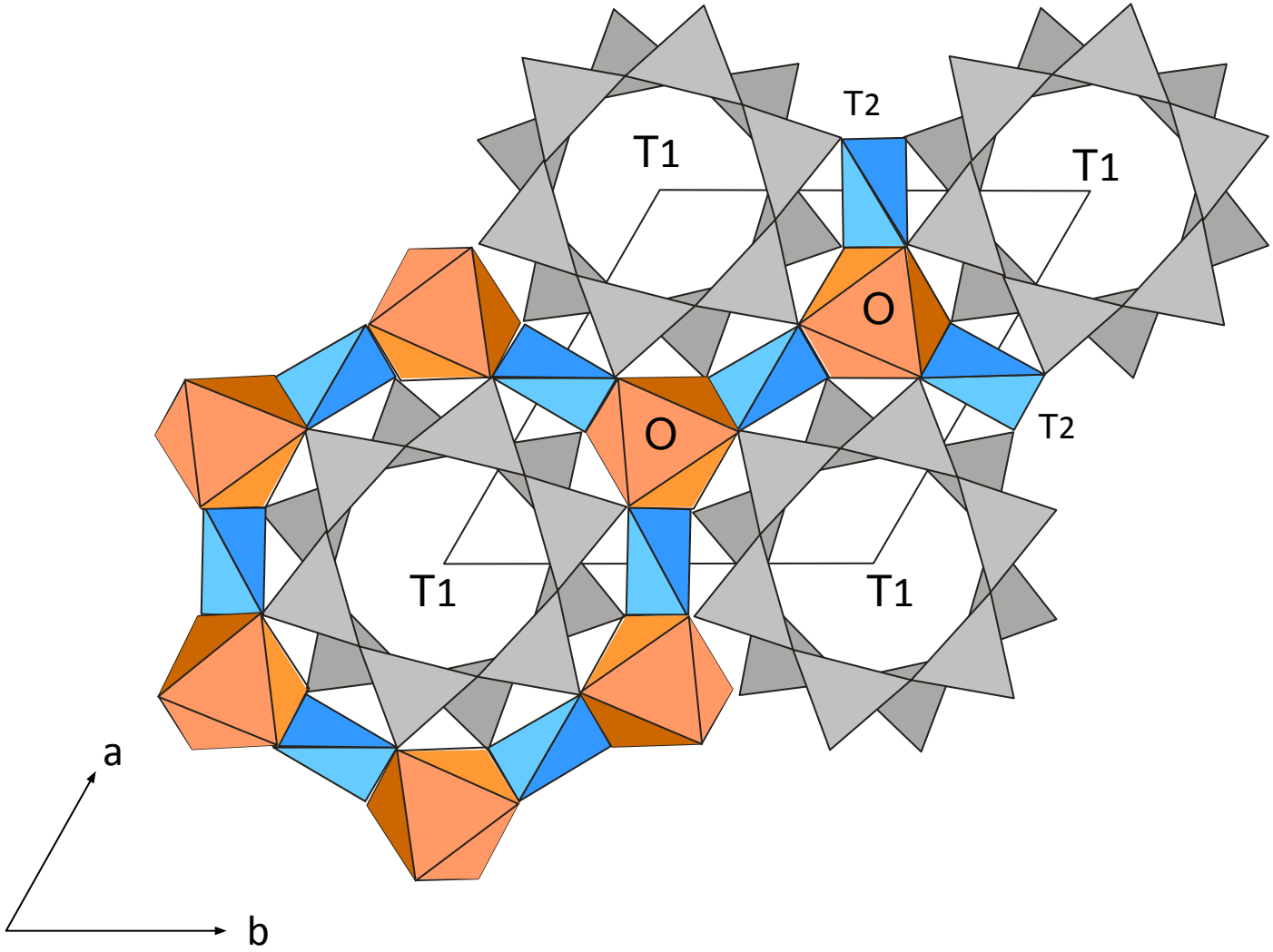


$[AlO_4]^{5-}$ и $[SiO_4]^{4-}$

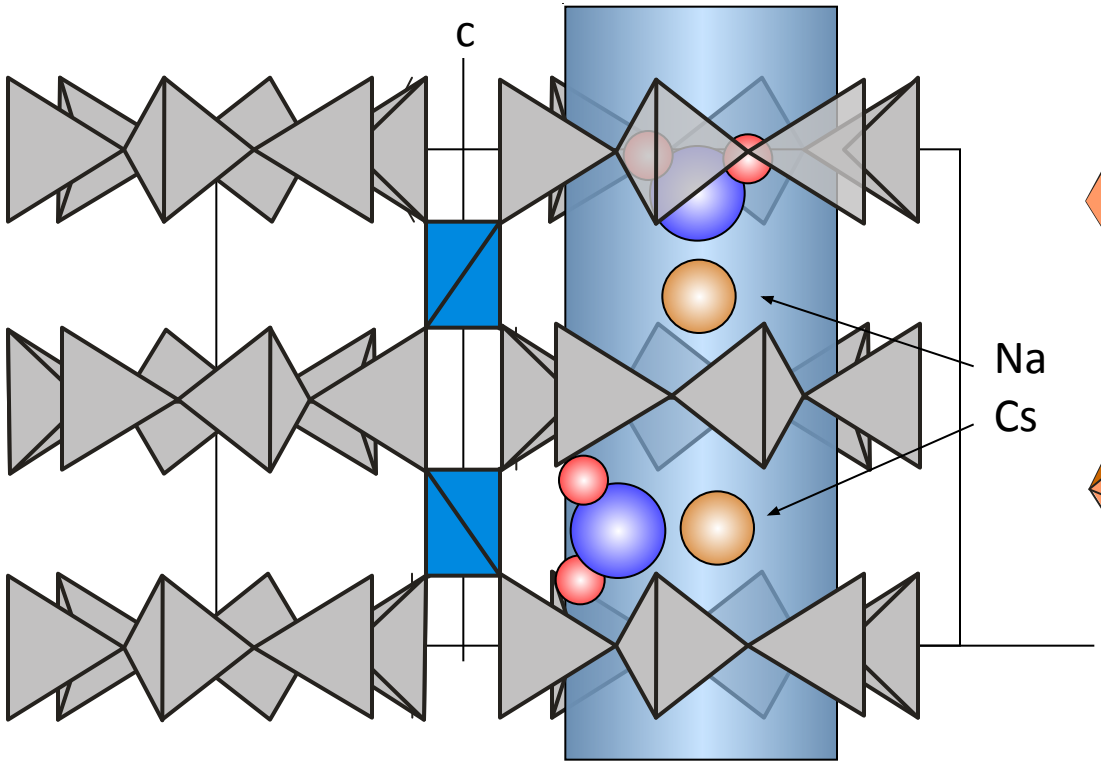
$Mg^{2+}$, $Fe^{2+}$

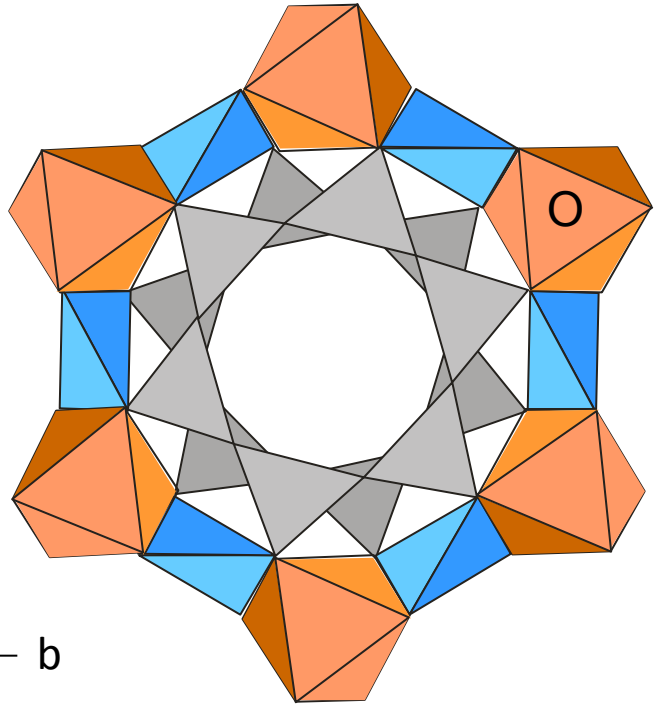
$$Mg_2[Al_2Si|Al_2Si_4O_{18}]$$

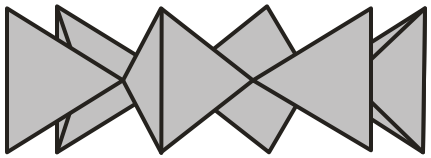
# Структура берилла



# Структура берилла

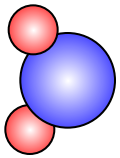


$[Si_6O_{18}]^{12-}$

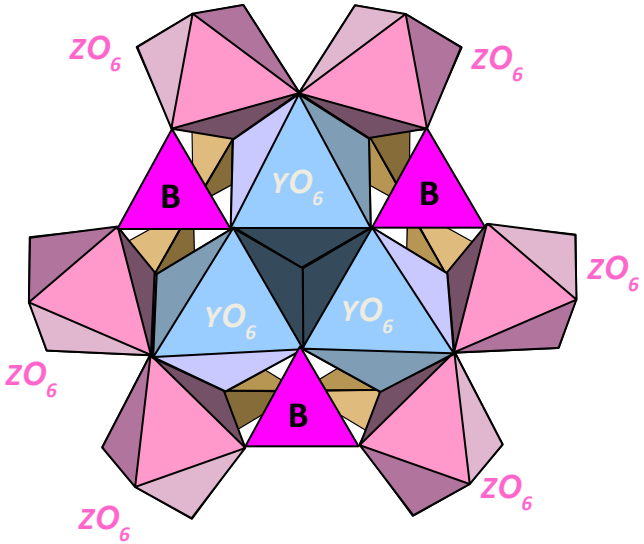
$[BeO_4]^{6-}$

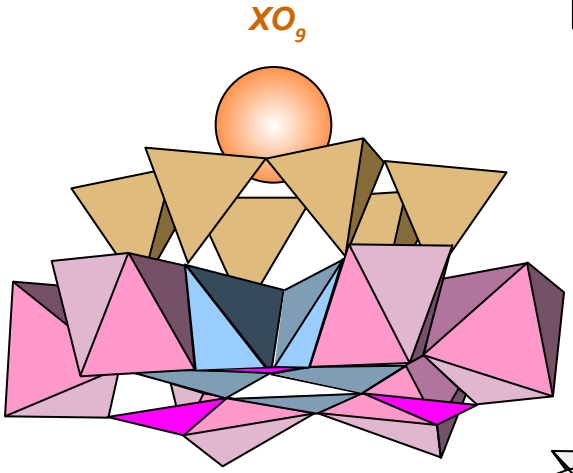


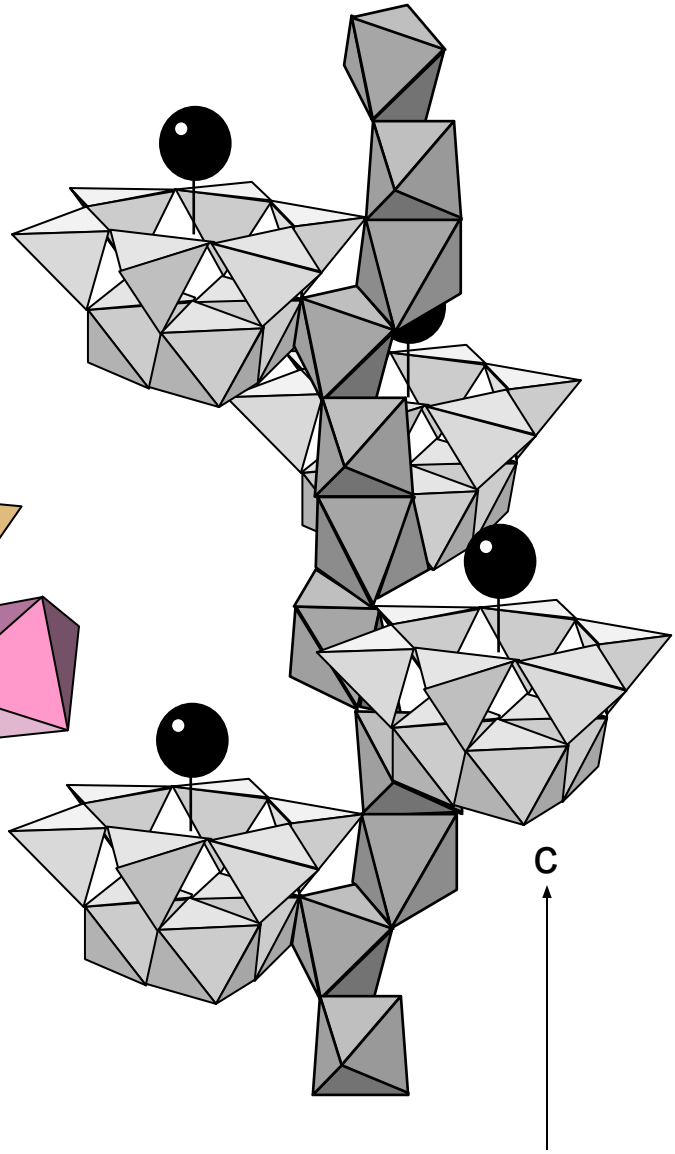
$H_2O$

# Структура турмалина

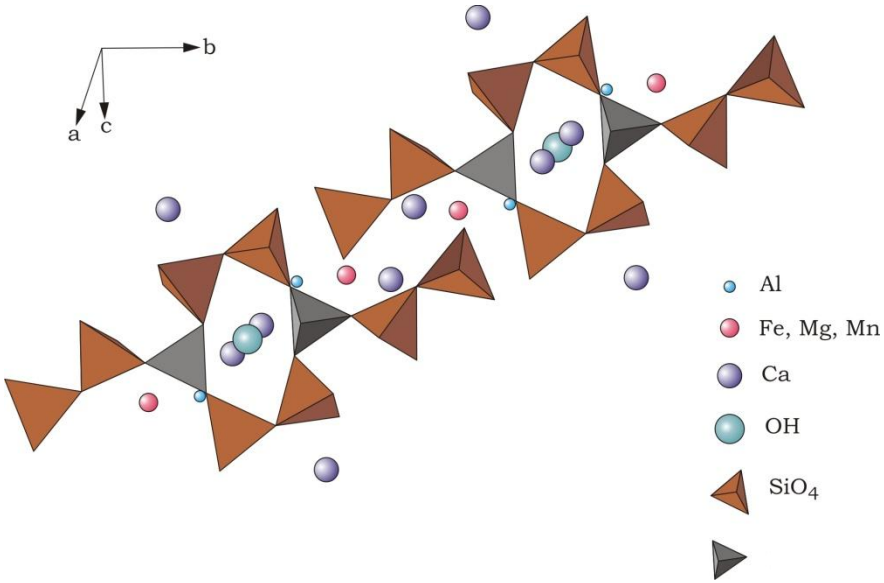
**антигоритовый остров**

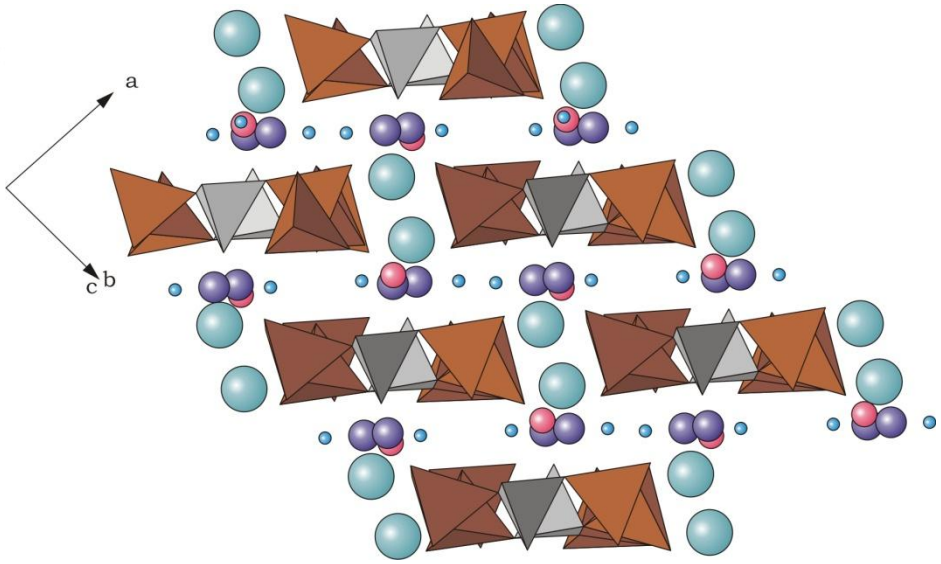


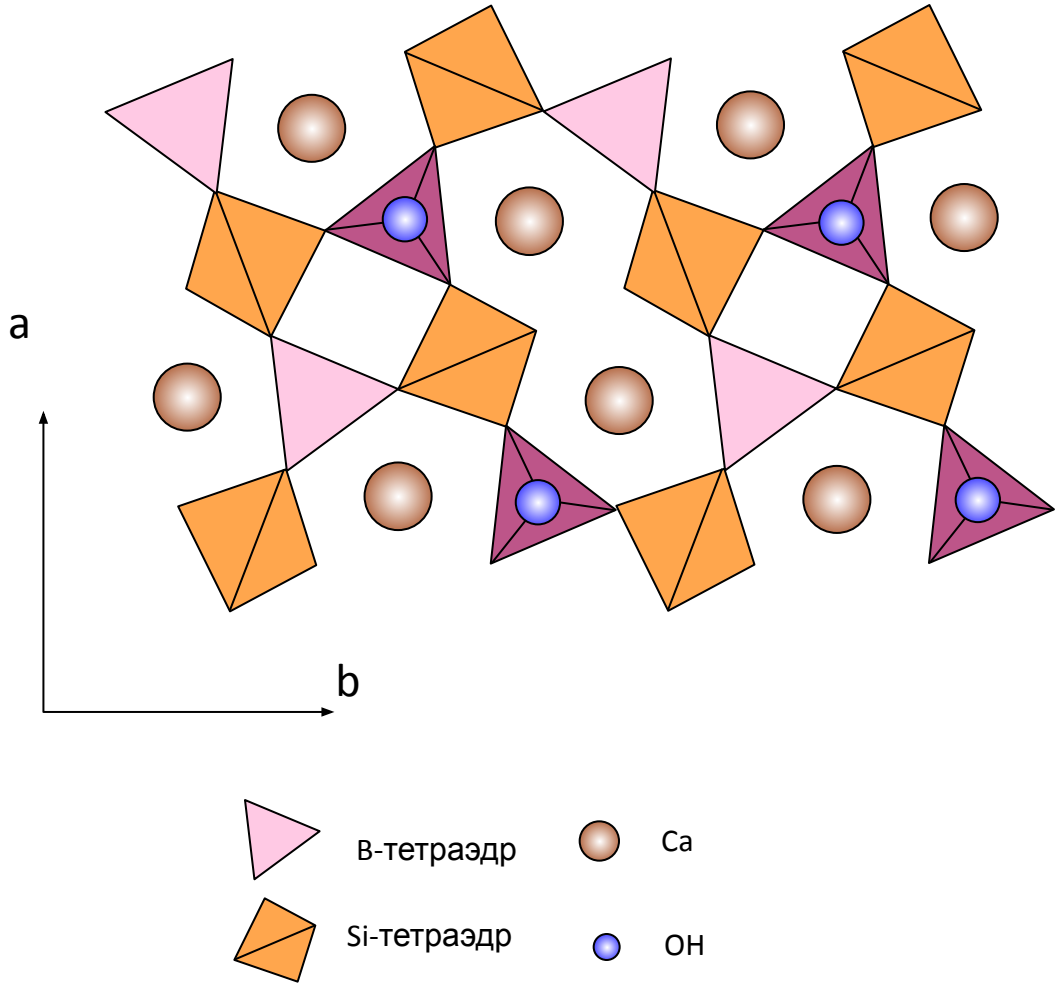



# Структура аксинита

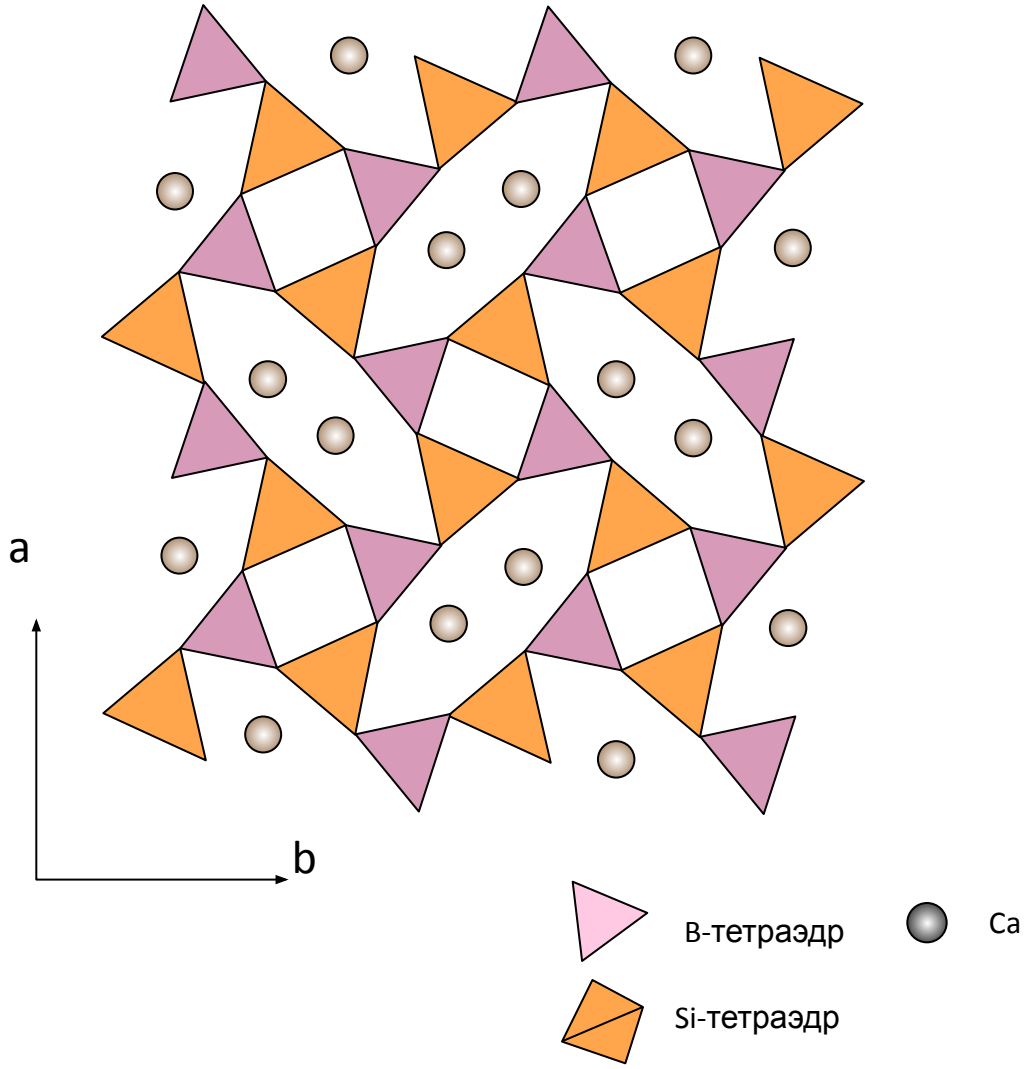


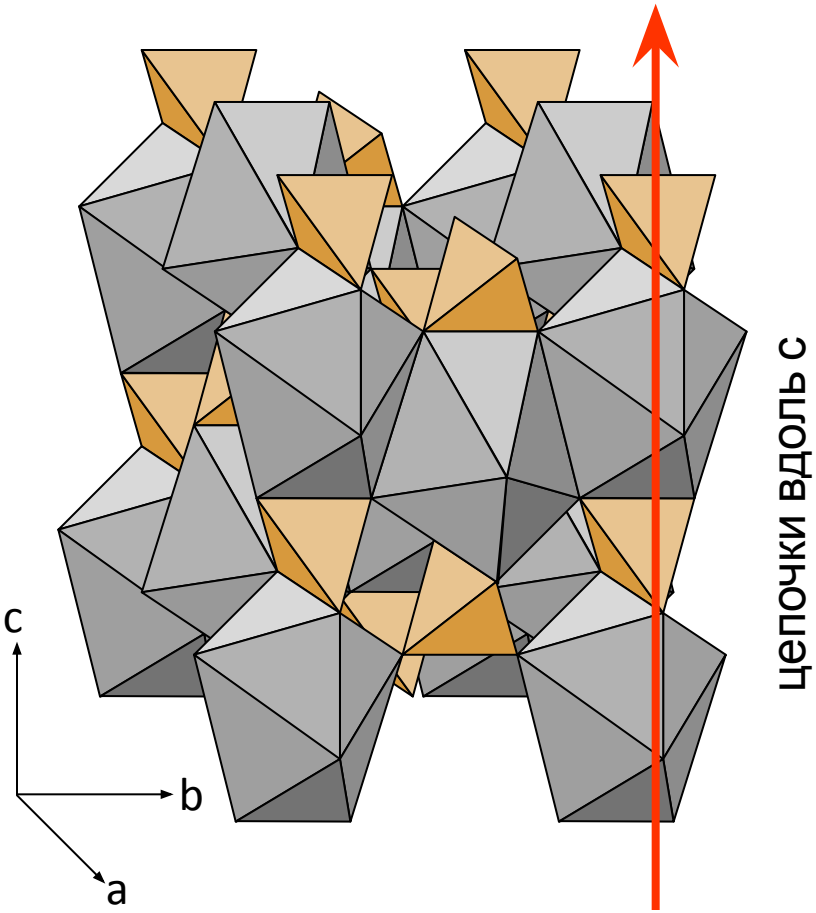
# Структура датолита

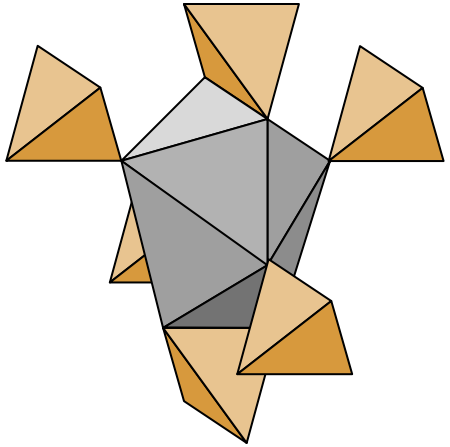


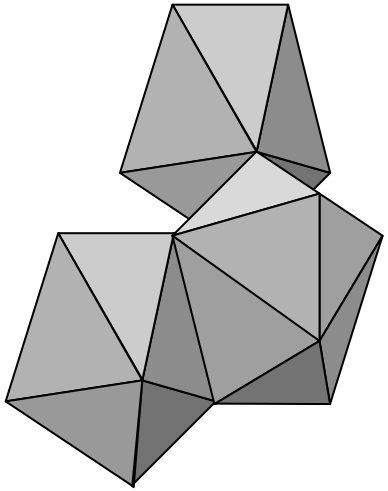
# Структура данбурита



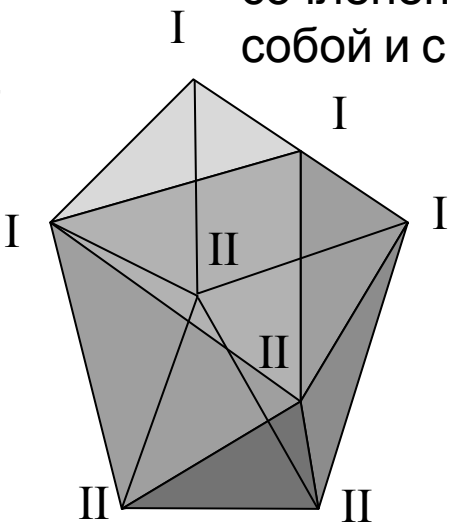
# Структура циркона





сочленение Zr полиэдров между собой и с $SiO_4$ тетраэдрами

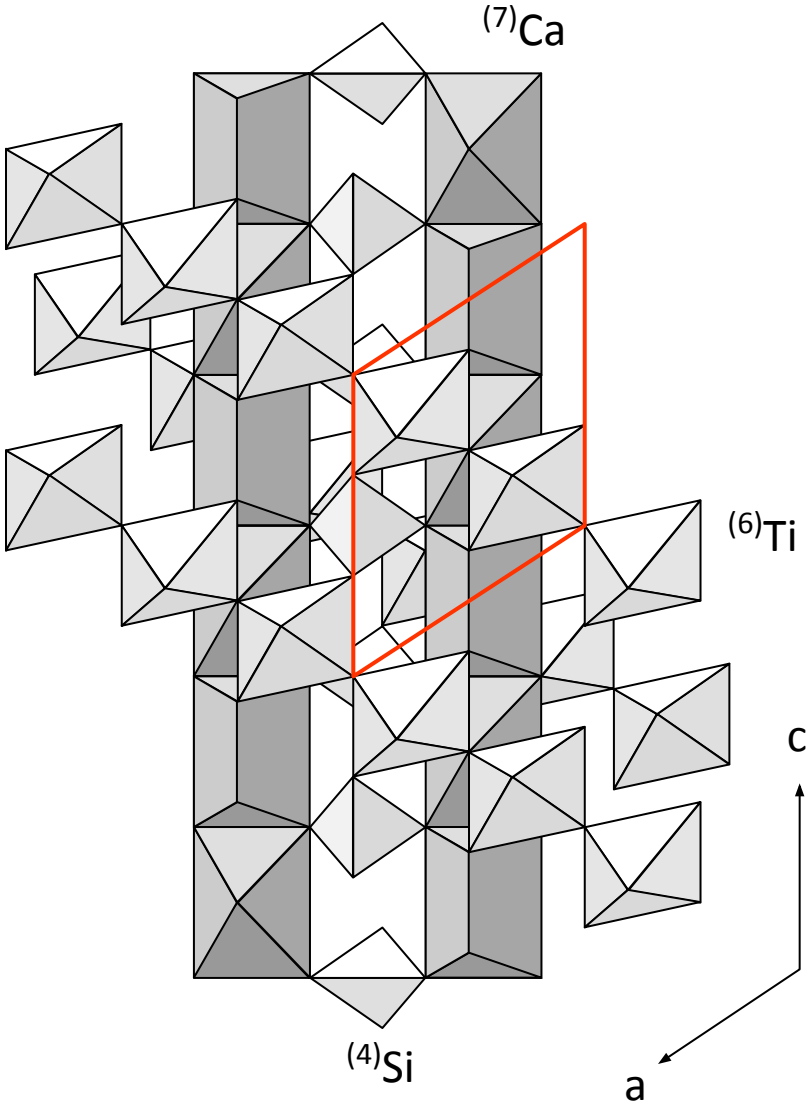



Zr восьмивершинник

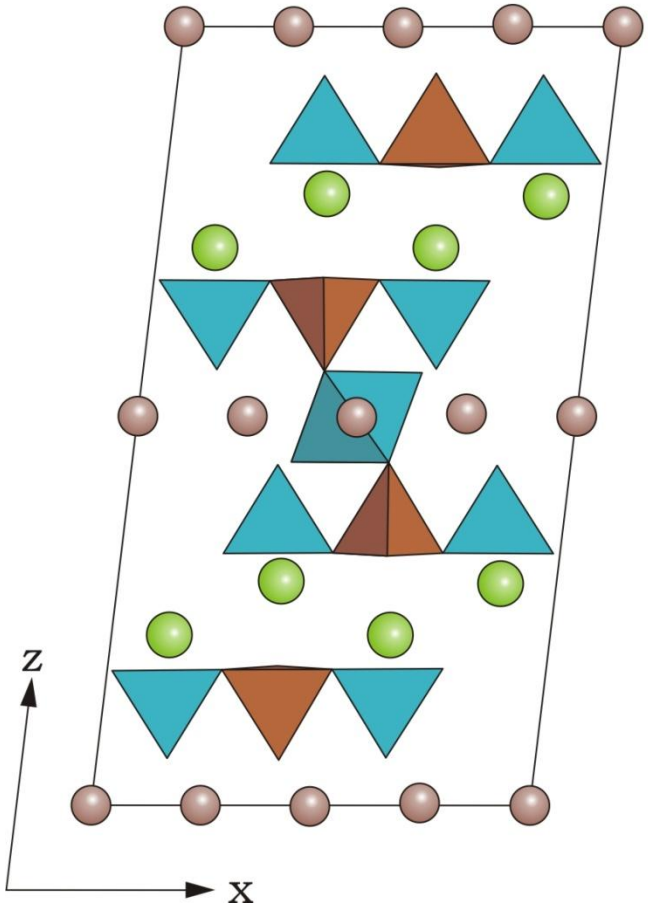
$КЧ_{Zr}$ = 8 – 6

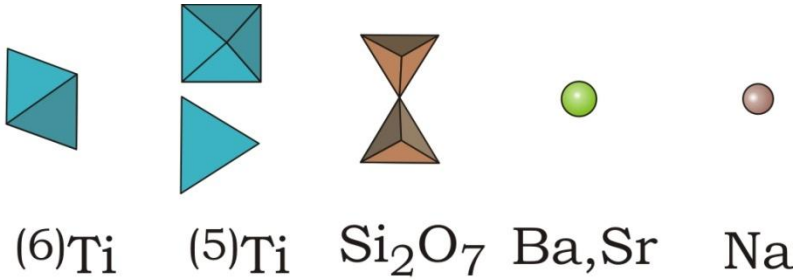
Zr смещен к вершинам I

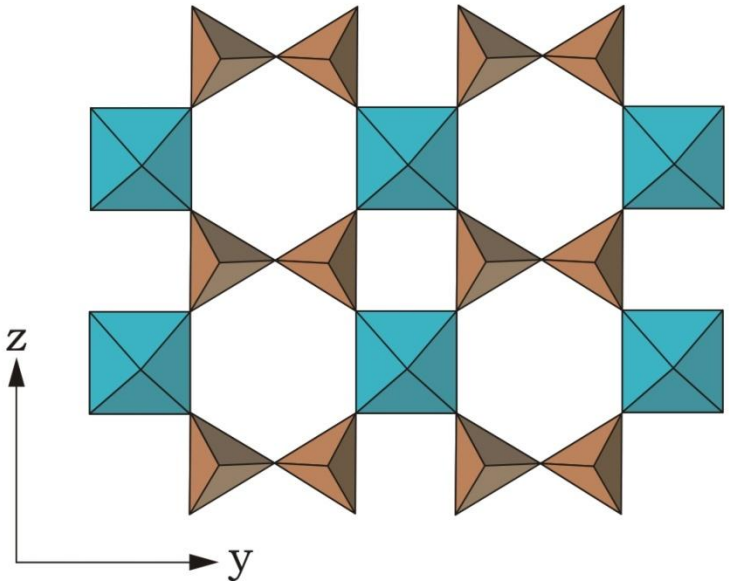
# Структура титанита C2/c



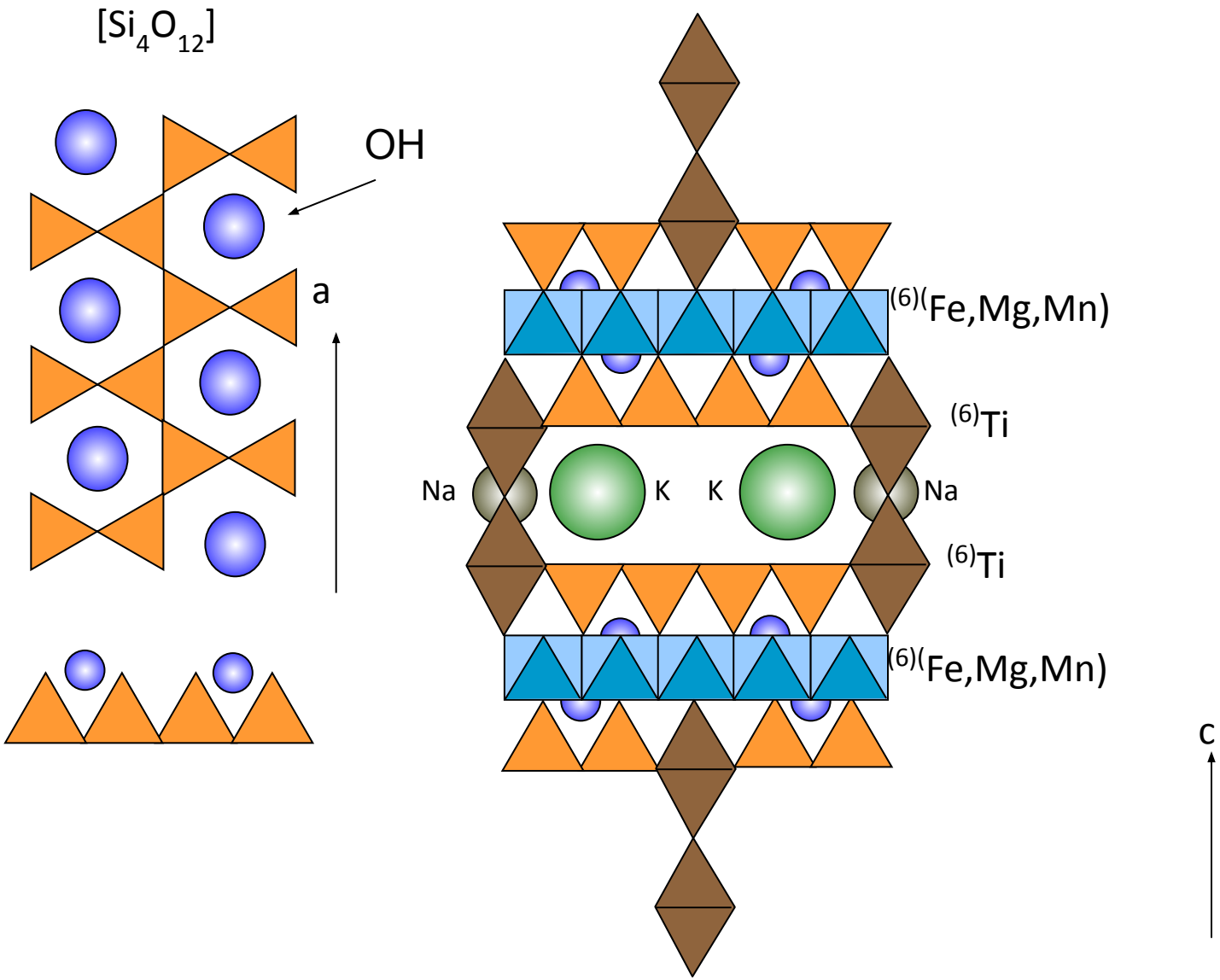
# Структура лампрофиллита



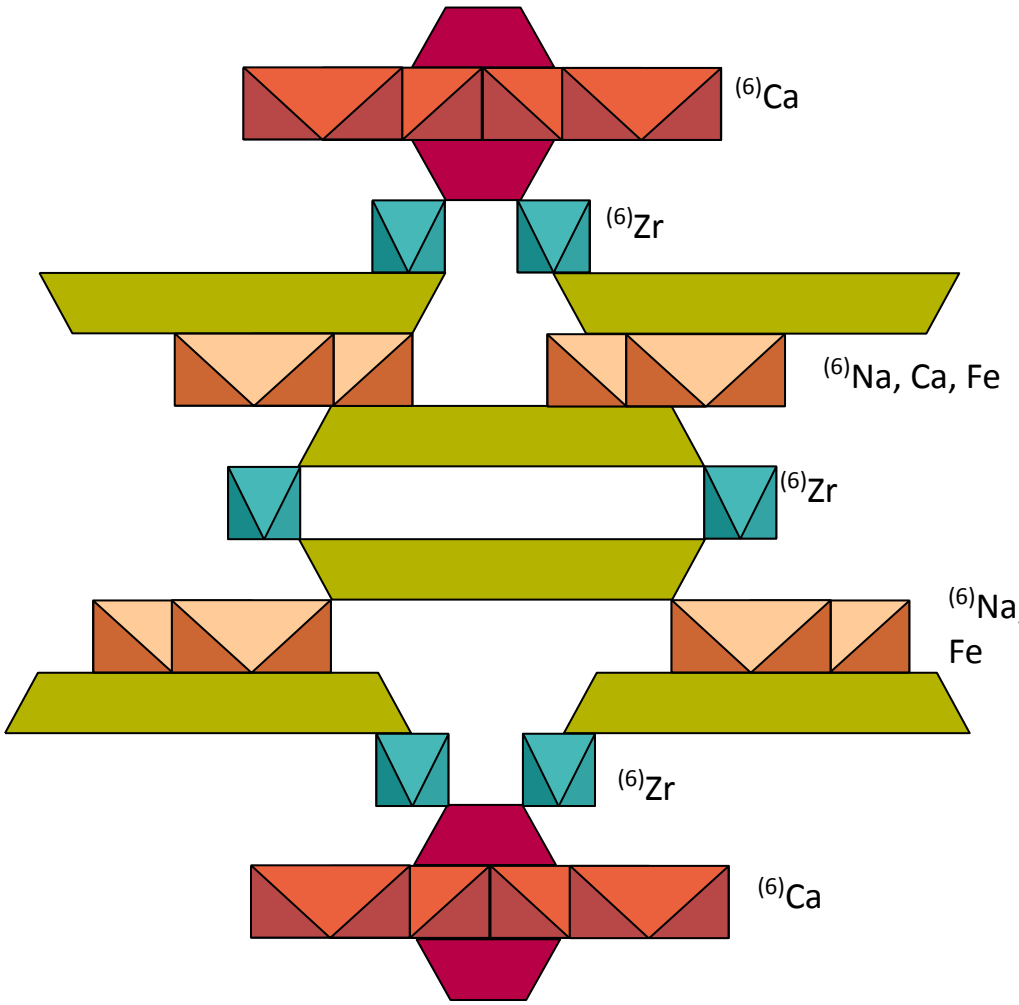



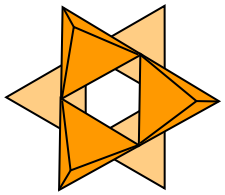
# Структура астрофиллита

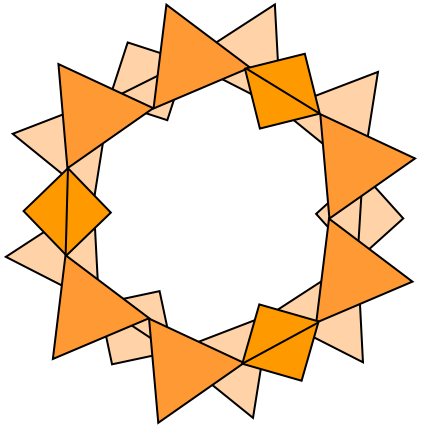


# Структура эвдиалита



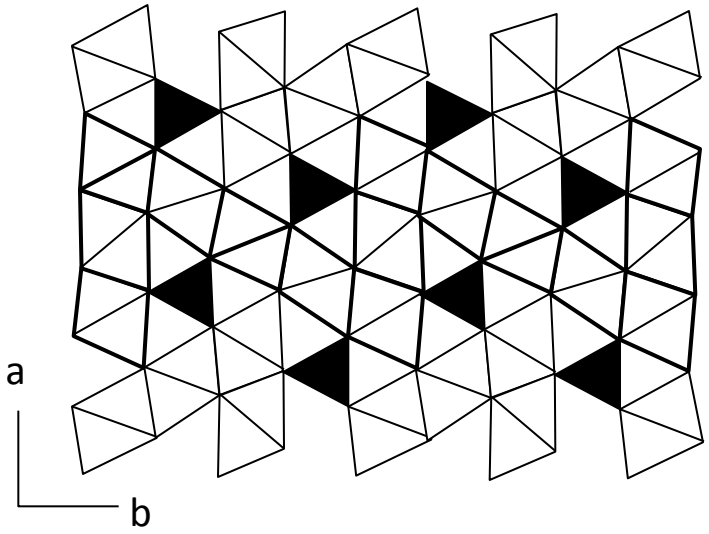

$[Si_3O_9]$



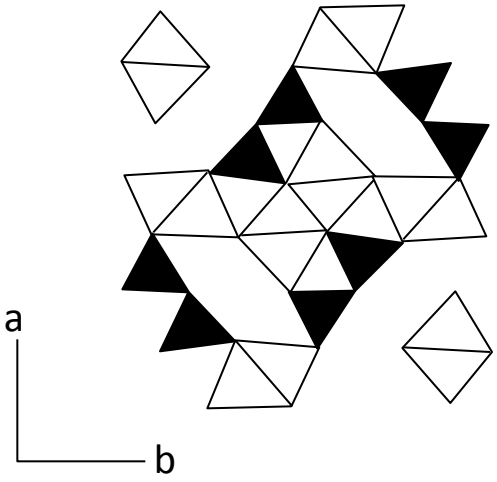


$[Si_9O_{27}H_{<3}]$

# Островные мотивы в боратах

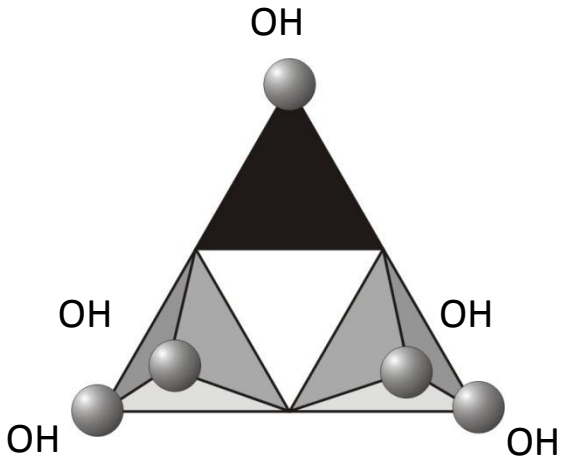



одиночные $[BO_3]$ группы в структуре *людвигита* $Mg_2FeO_2[BO_3]$

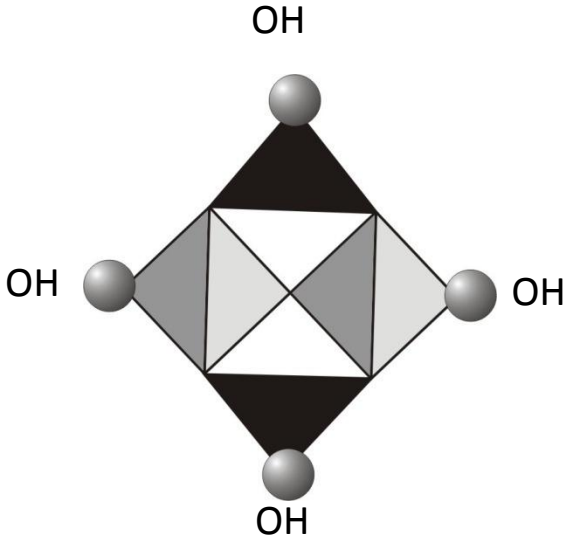



сдвоенные $[BO_3]$ группы в структуре *ссайбелиита* $Mg_2(OH)[B_2O_4(OH)]$

# Кольцевые мотивы в боратах

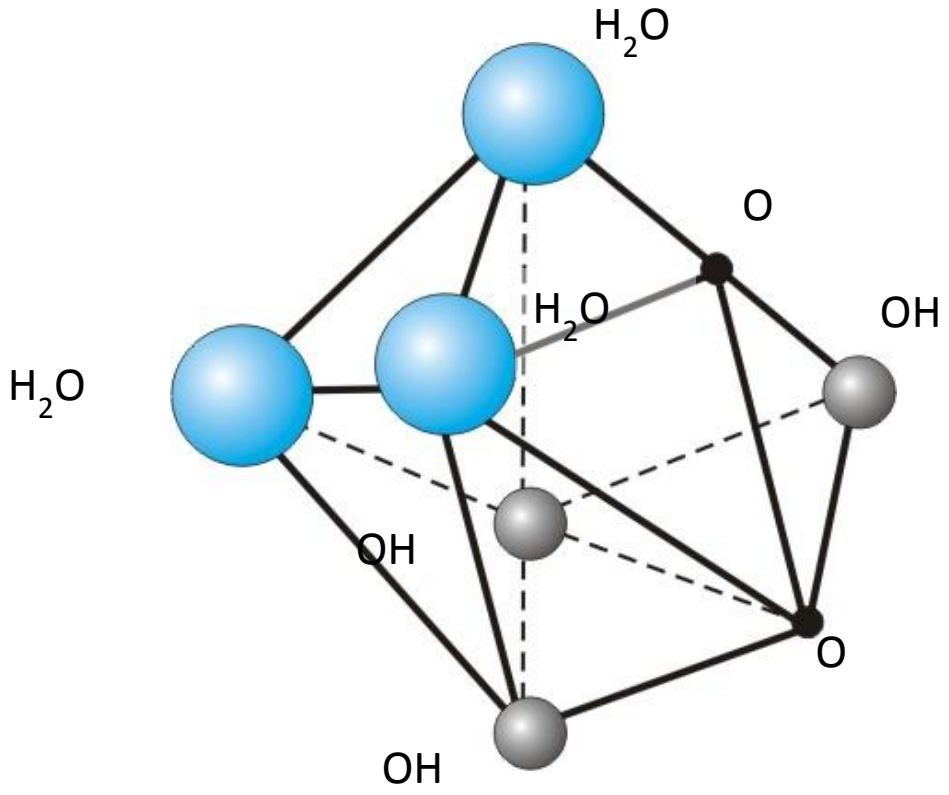



3-членное кольцо *иньоита*
(2t+1Δ)
$Ca(H_2O)_4[^{(4)}B_2{}^{(3)}BO_3(OH)_5]$



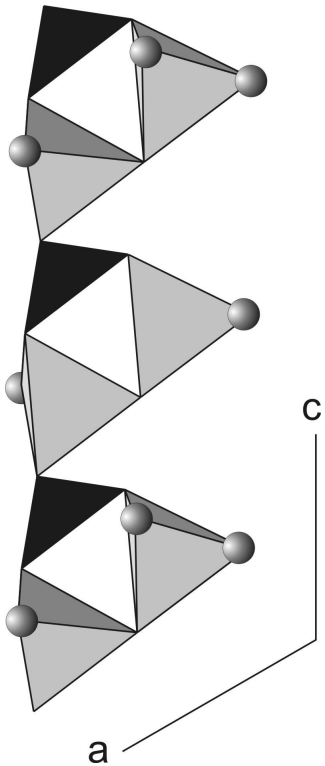

4-членное кольцо *буры*
(2t+2Δ)
$Na_2(H_2O)_8[^{(4)}B_2{}^{(3)}B_2O_5(OH)_4]$

# Вода в боратах

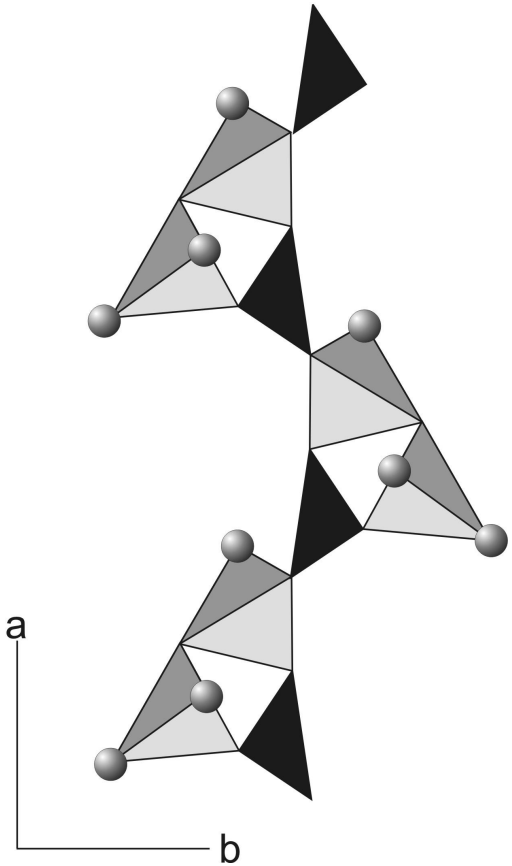



Полиэдр Ca в структуре **иньоита** КЧ=8 $CaO_2(OH)_3(H_2O)_3$

# Цепочечные мотивы в боратах

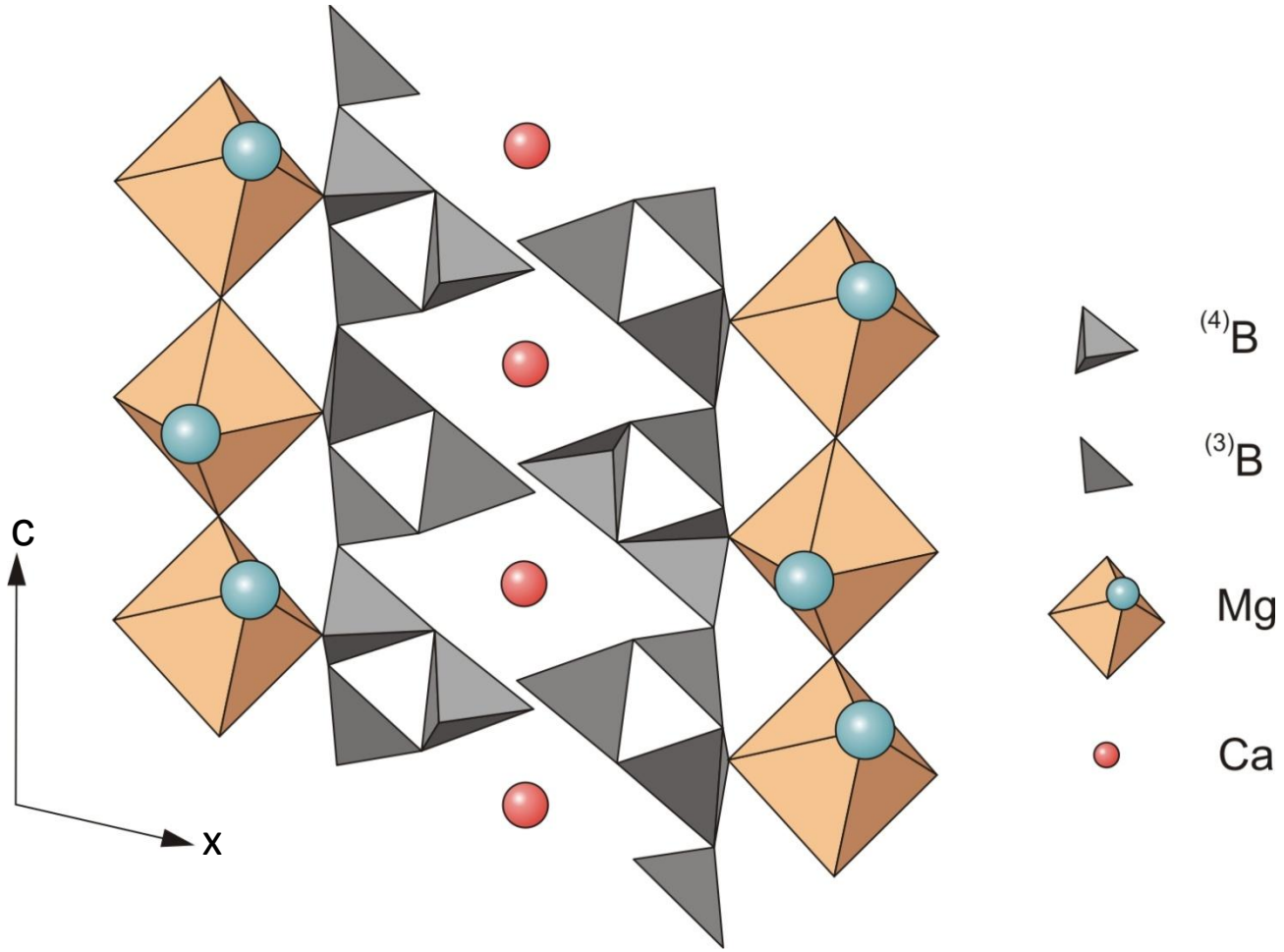



гидроборацит
$CaMg(H_2O)_3[^{(4)}B_2{}^{(3)}BO_4(OH)_3]_2$



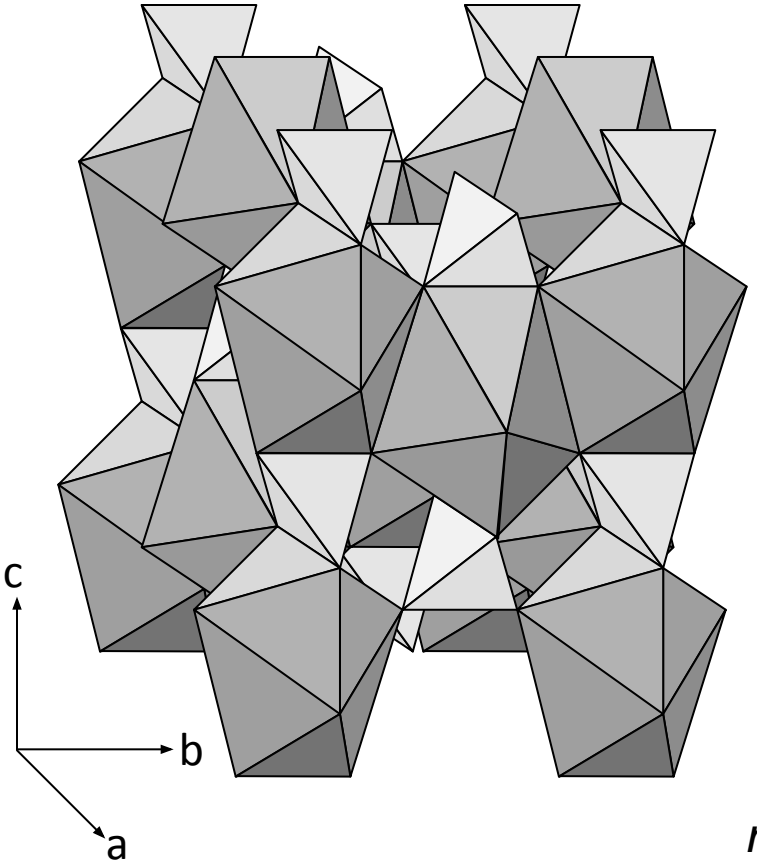

колеманит
$Ca(H_2O)[^{(4)}B_2{}^{(3)}BO_4(OH)_3]$

# Структура гидроборацита



# Структуры ксенотима и монацита

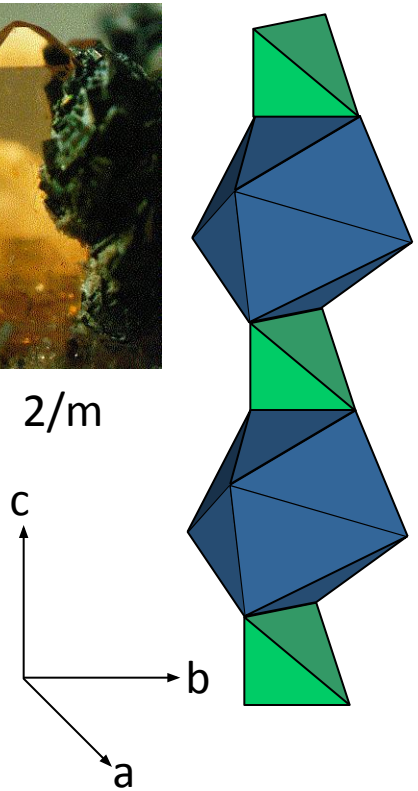
Структура ксенотима



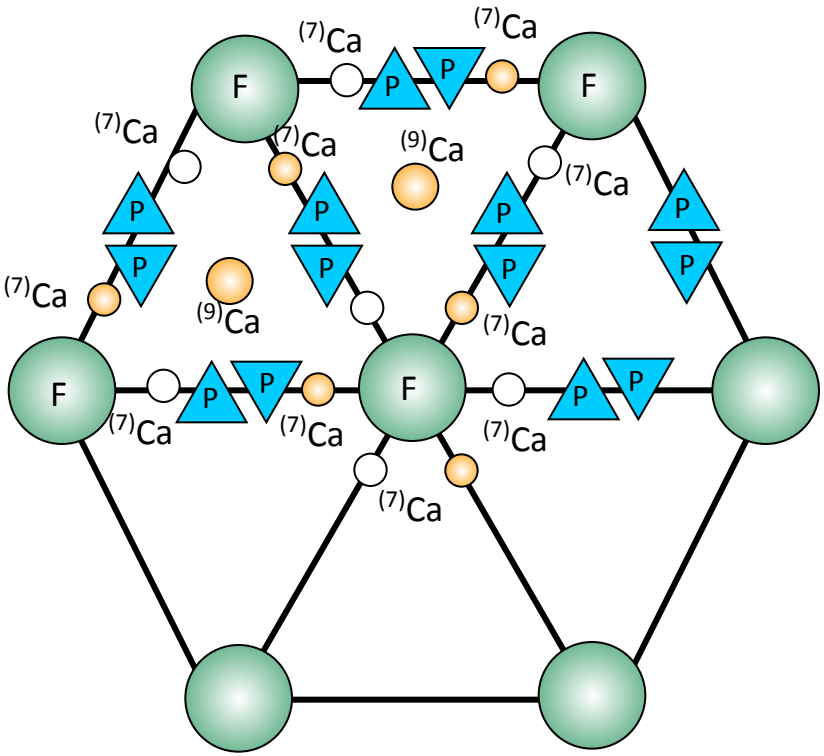
*тетр.*, 4/mmm

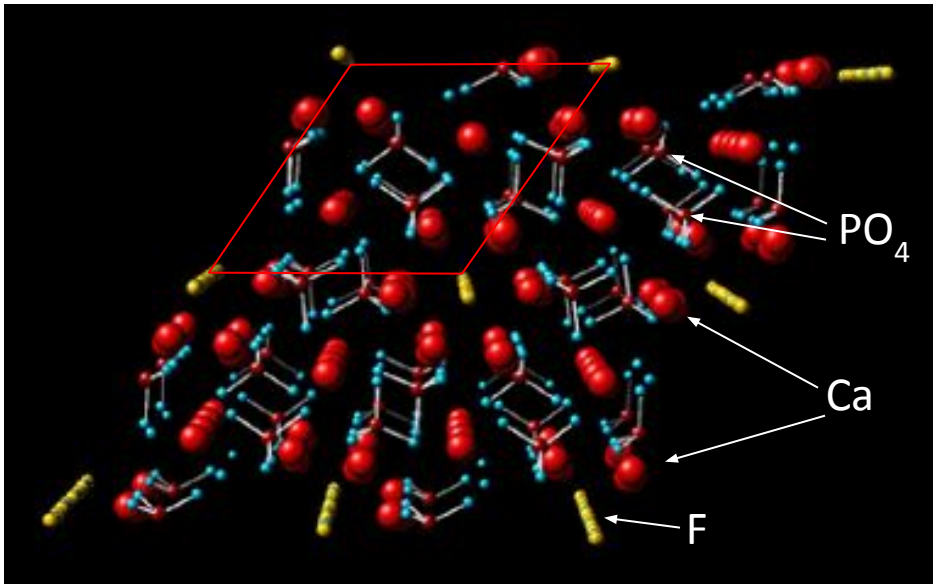
Искаженные полиэдры $CeO_8$ и $PO_4$ в структуре монацита

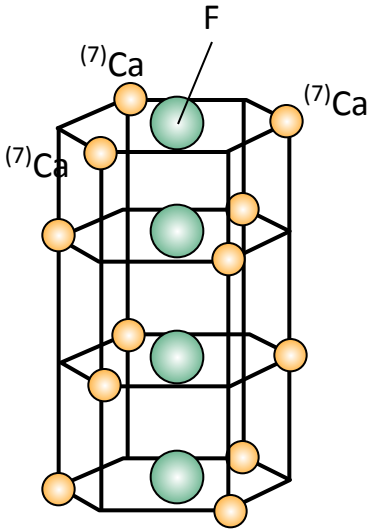
*мон.*, 2/m

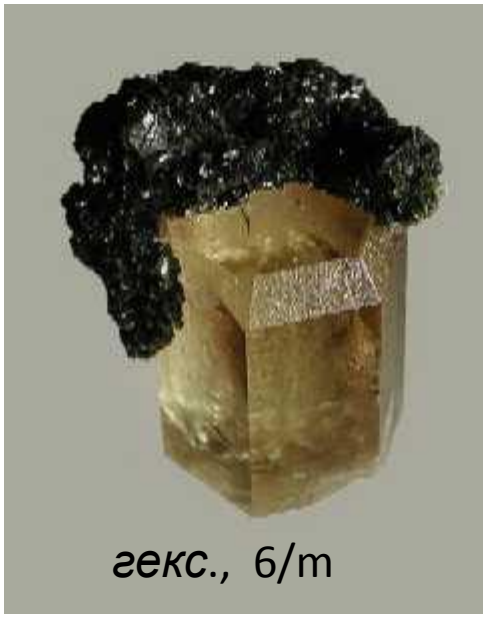


# Структура апатита

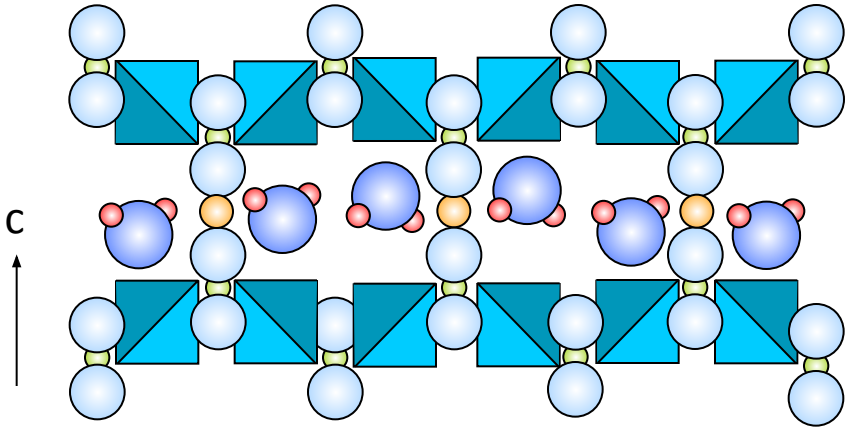


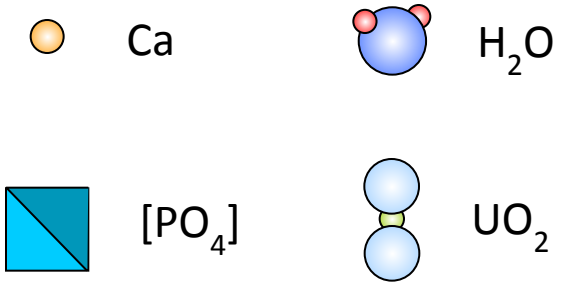



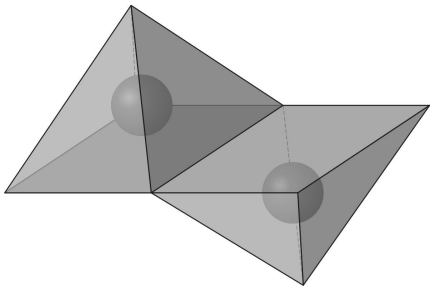



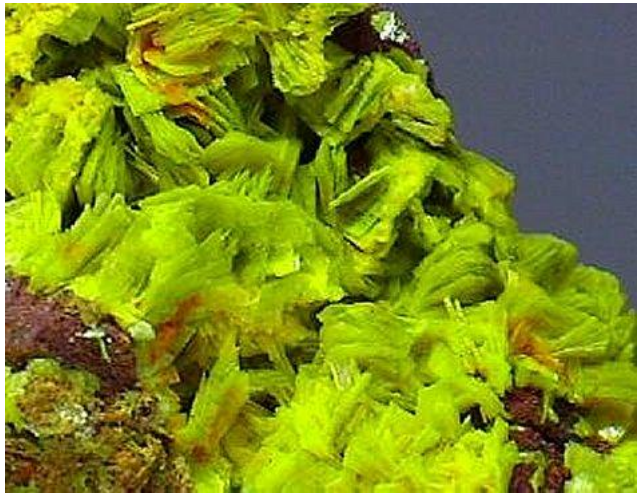
# Структура отенита



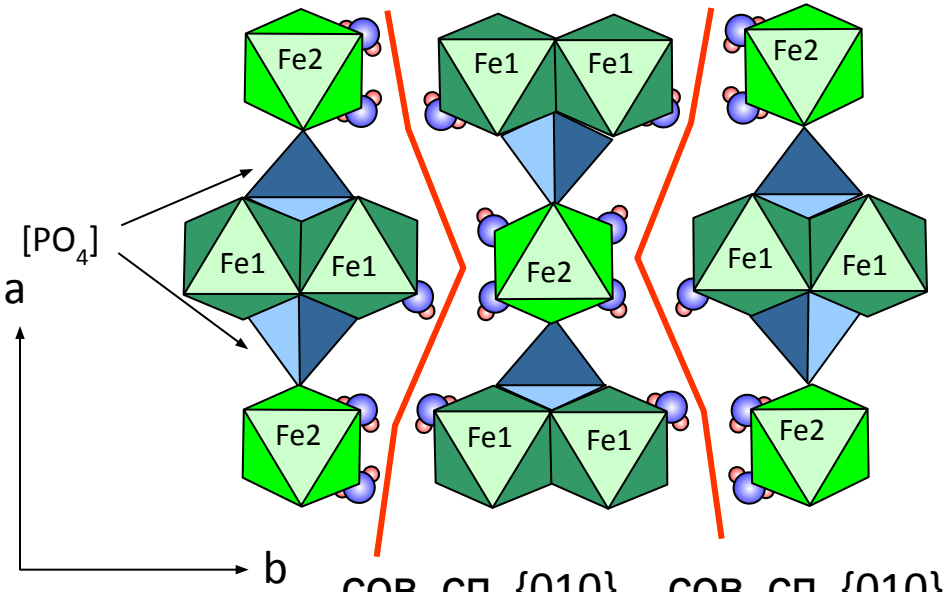
$V_2O_8$



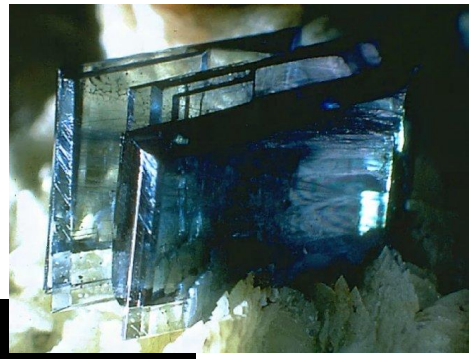
отенит $Ca\{(UO_2)_2[PO_4]_2\}\cdot 10H_2O$

торбернит $Cu\{(UO_2)_2[PO_4]_2\}\cdot 10H_2O$

# Структуры фосфатов Fe, Co, Ni

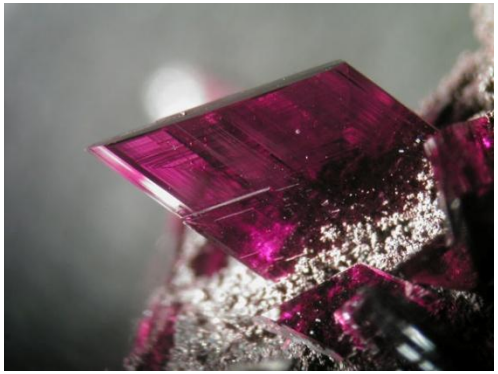



сов. сп. {010}  сов. сп. {010}



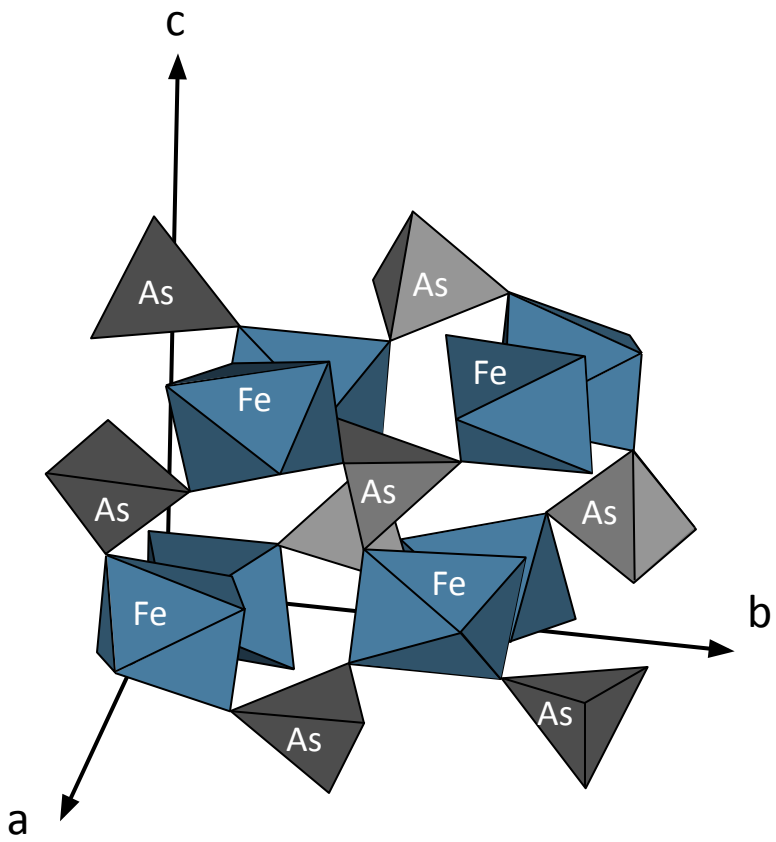
вивианит
$Fe^{2+}{}_3(H_2O)_8[PO_4]_2$
высокая доля $Fe^{3+}$
- керченит

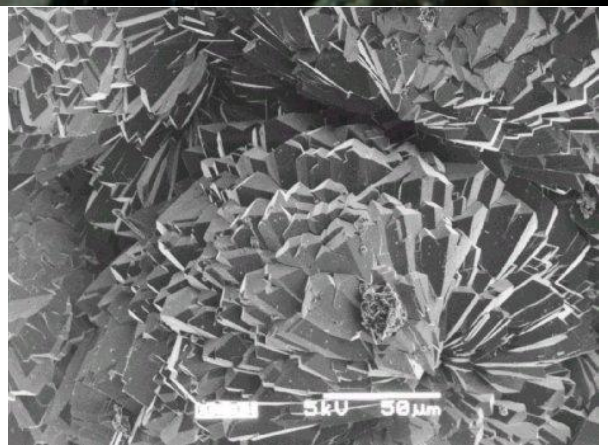
***мон.* 2/m**



эритрин $Co^{2+}{}_3(H_2O)_8[AsO_4]_2$

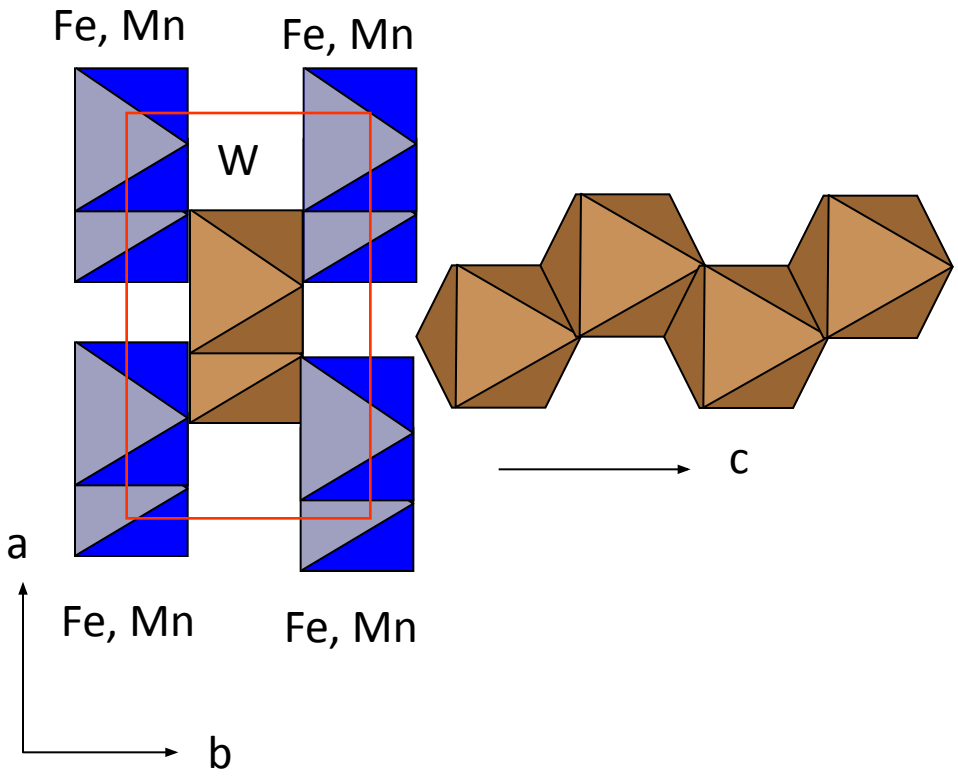
# Структура скородита



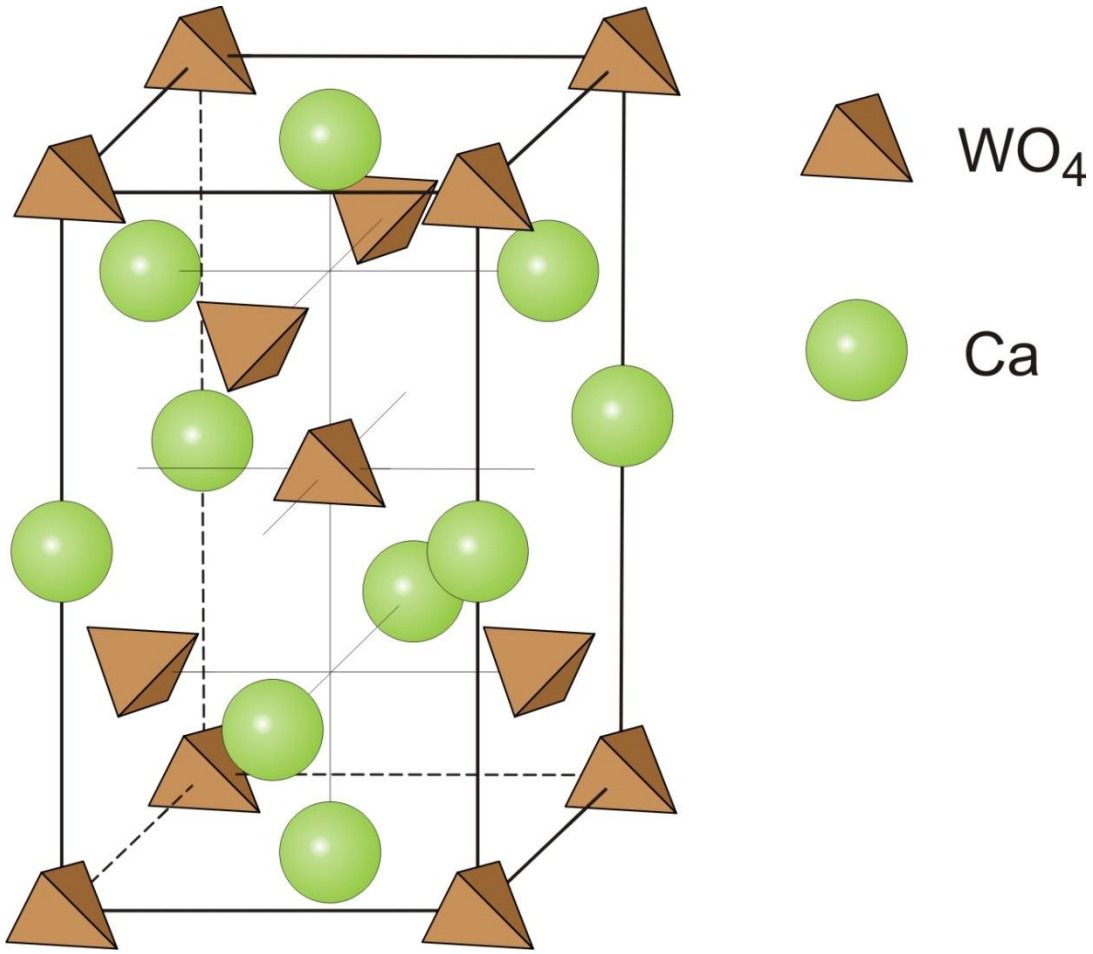



- субкаркасная структура скородита $Fe(H_2O)_2[AsO_4]$

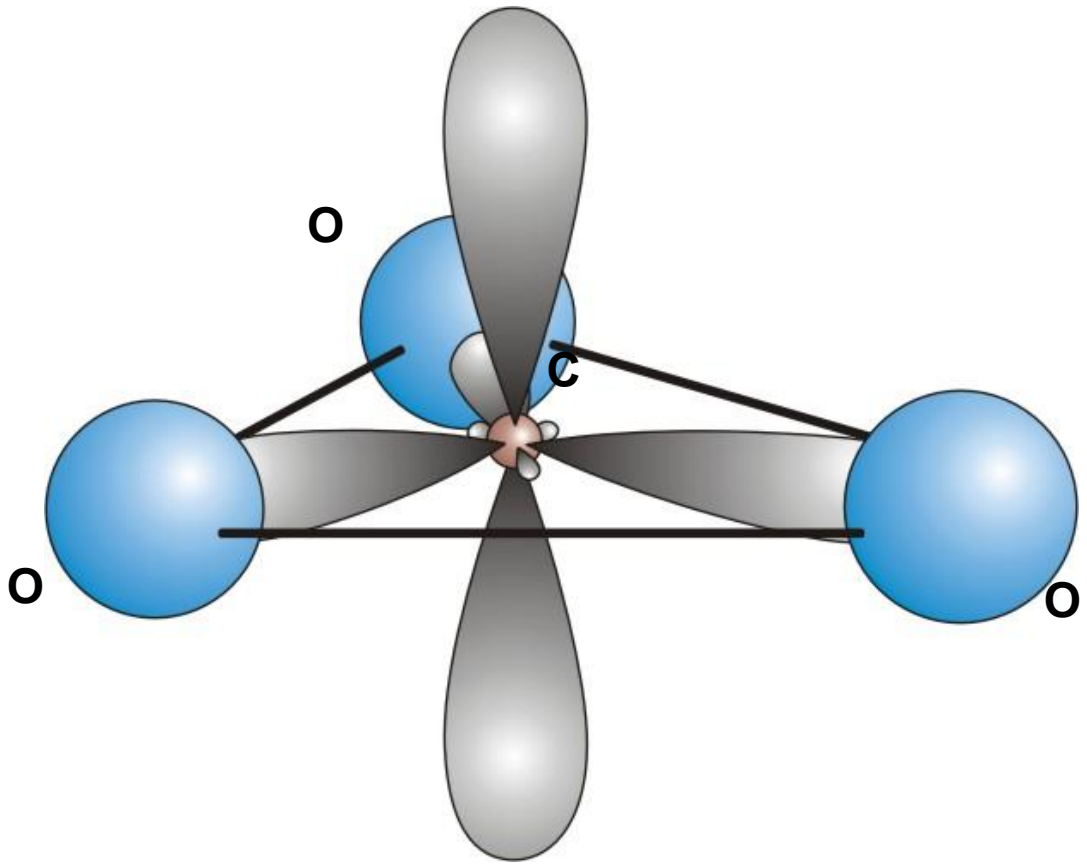
# Структура вольфрамита



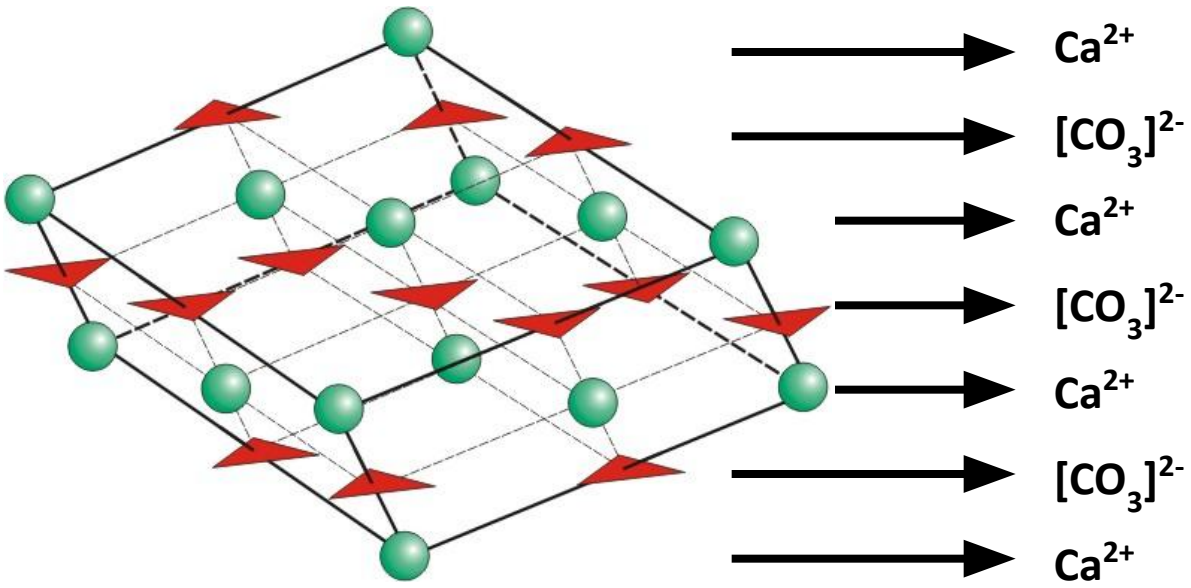
# Структура шеелита



# Структурные особенности карбонатов

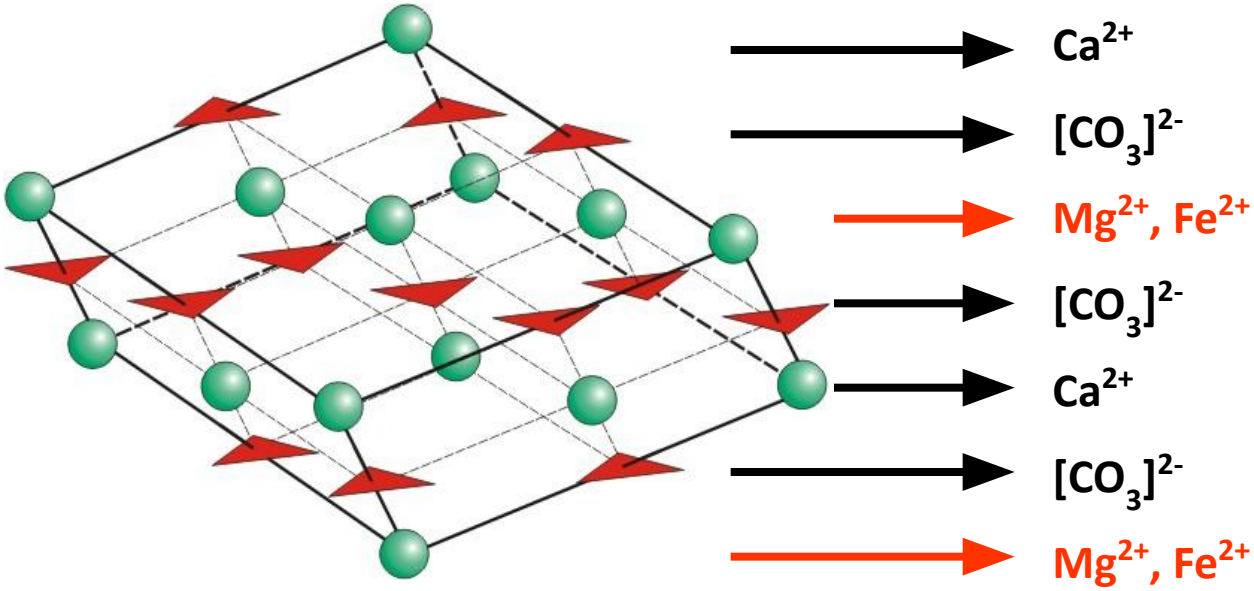


# Структурный тип кальцита

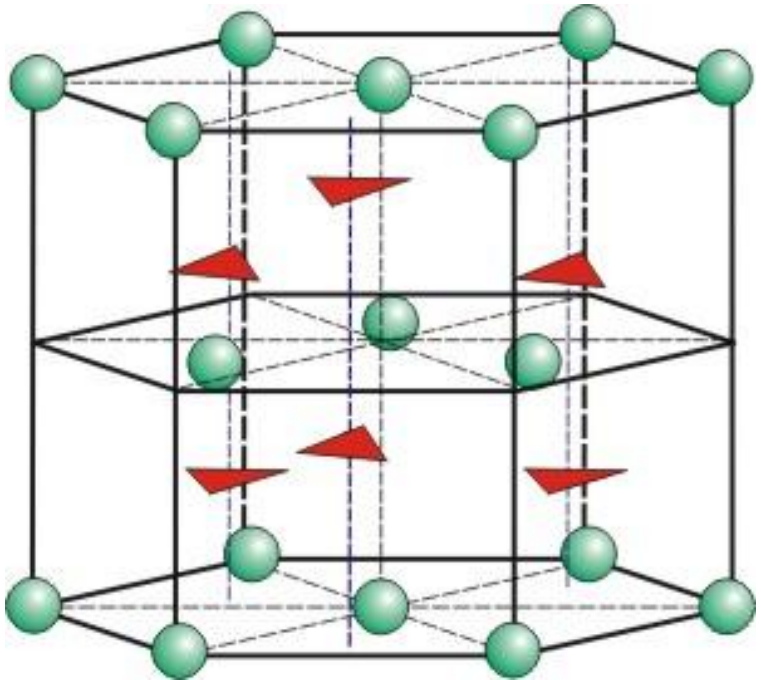


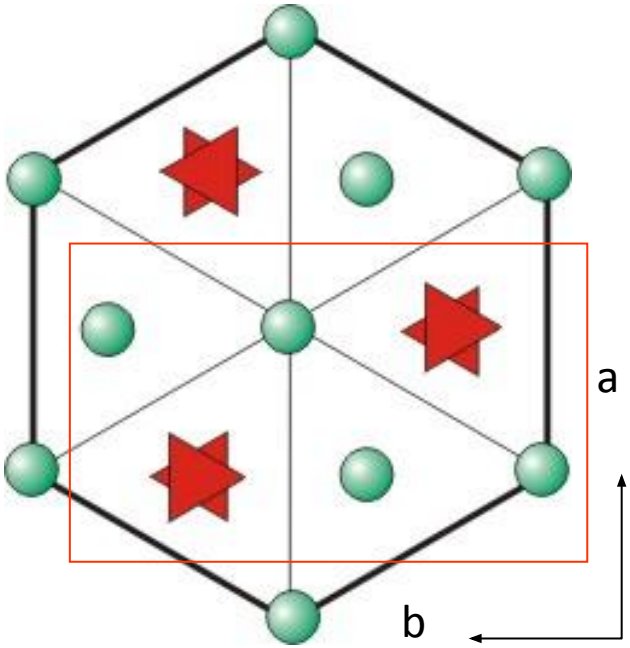

- Структура является производной от структуры NaCl

# Структуры двойных карбонатов

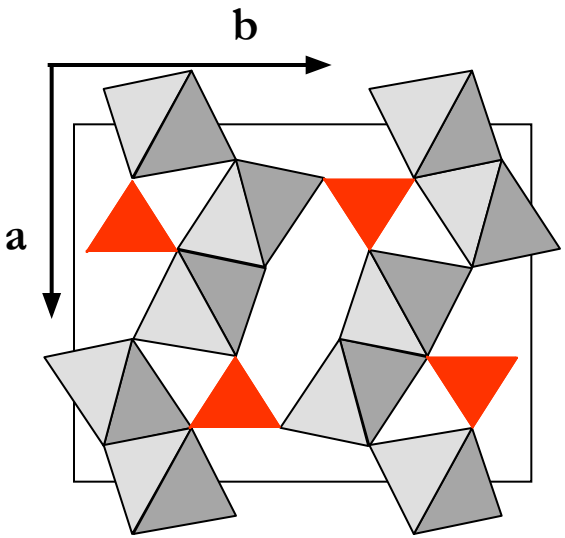


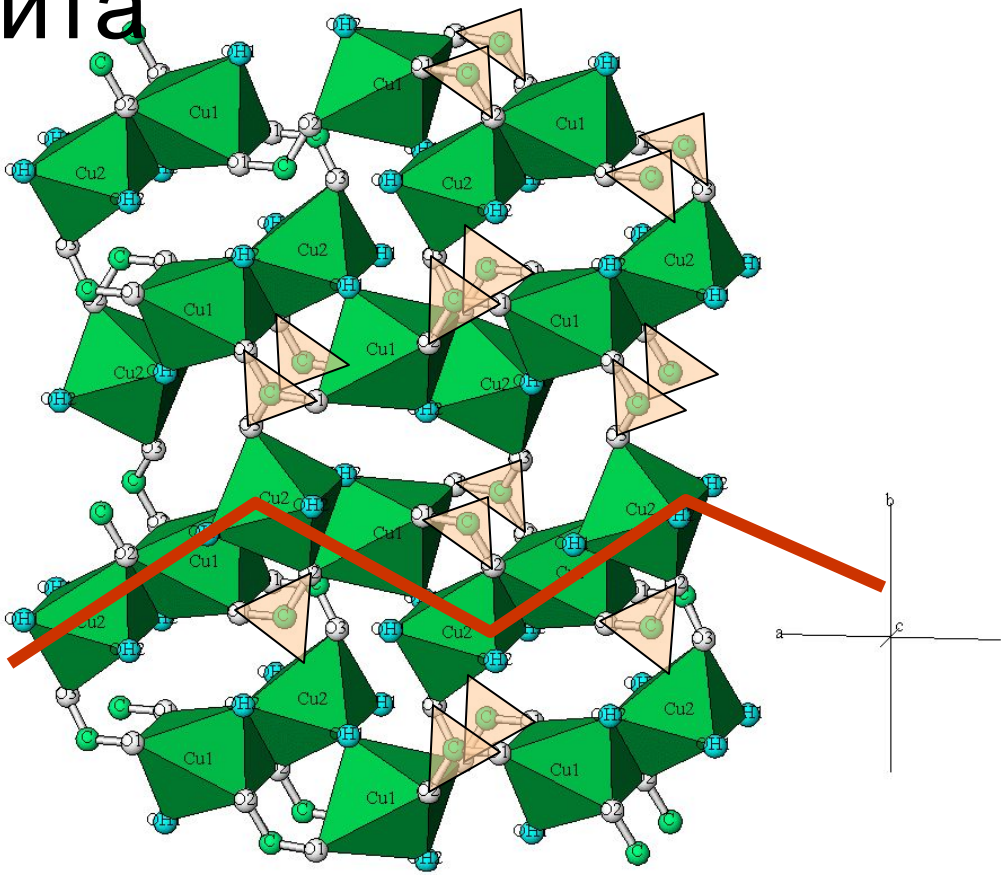
# Структурный тип арагонита

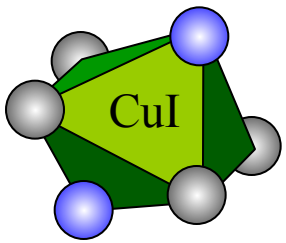


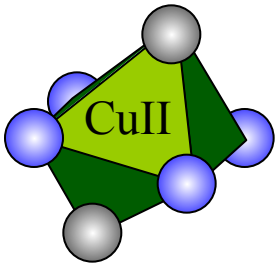


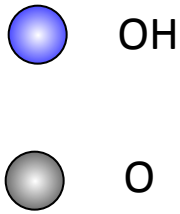
# Структура малахита



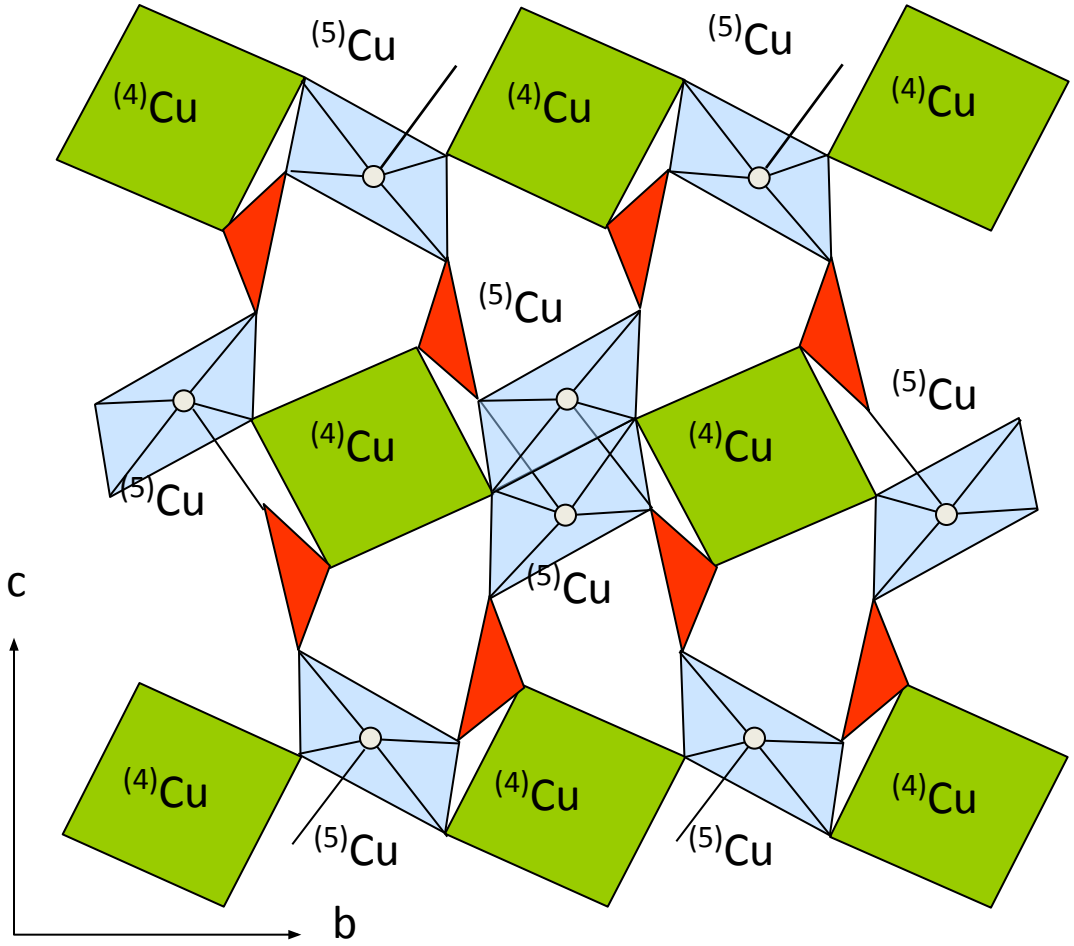



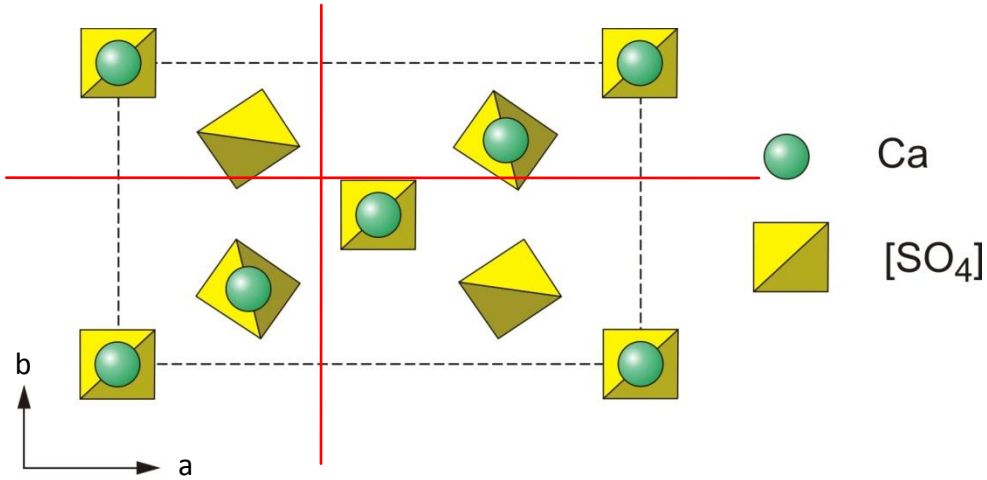



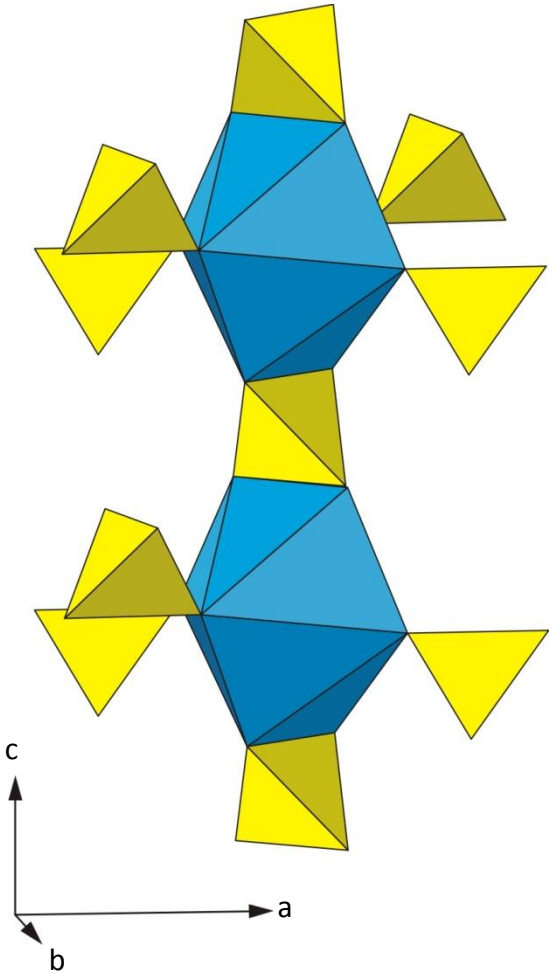
# Структура азурита



# Структуры безводных сульфатов

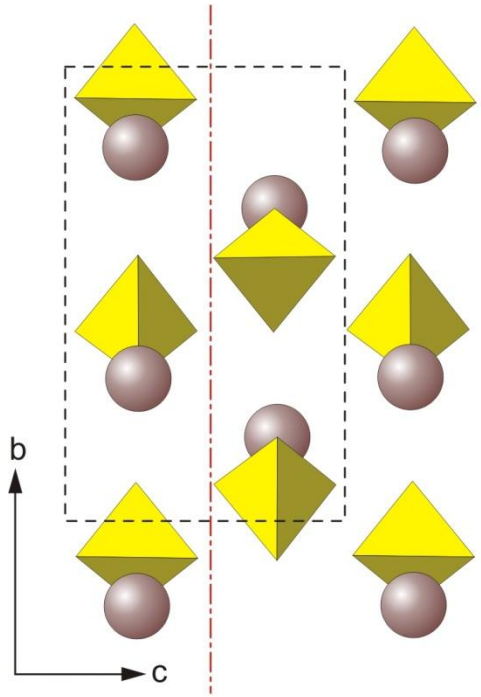
ангидрит $Ca[SO_4]$



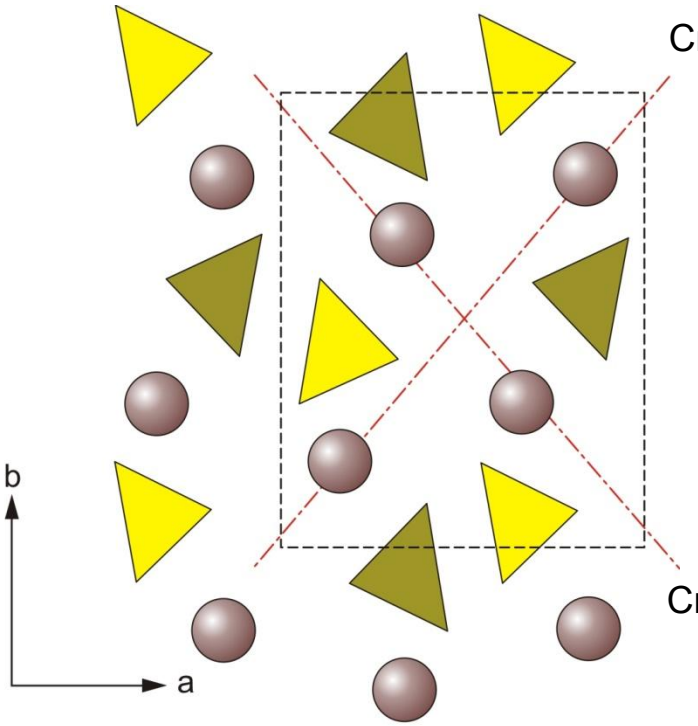



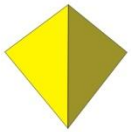
# Структуры безводных сульфатов

барит $Ba[SO_4]$ – целестин $Sr[SO_4]$




Сп по {001}



$[SO_4]$

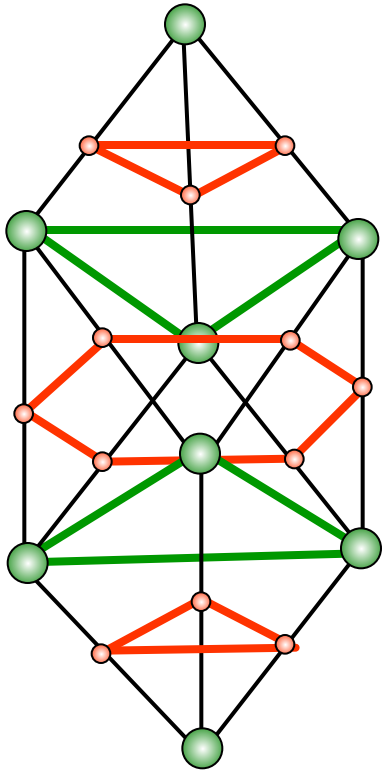
Ba, Sr

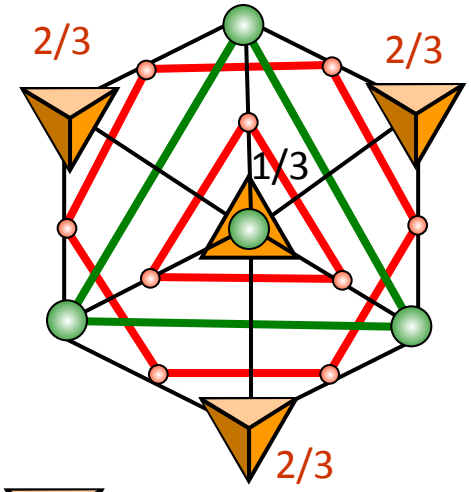
# Структура алунита

**Алунит $KAl_3[SO_4]_2(OH)_6$**

**Ярозит $KFe_3[SO_4]_2(OH)_6$**

*триг.* $\bar{3}$m

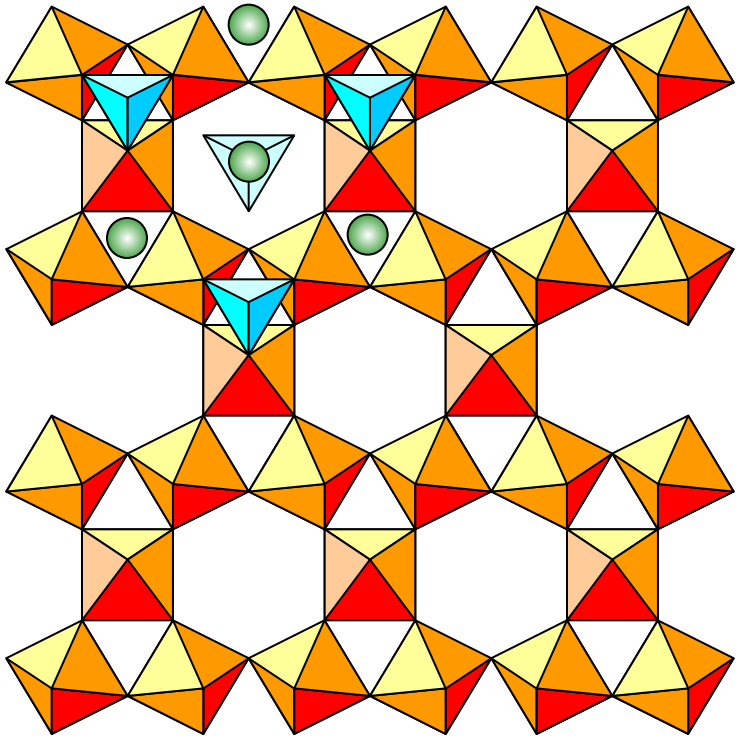




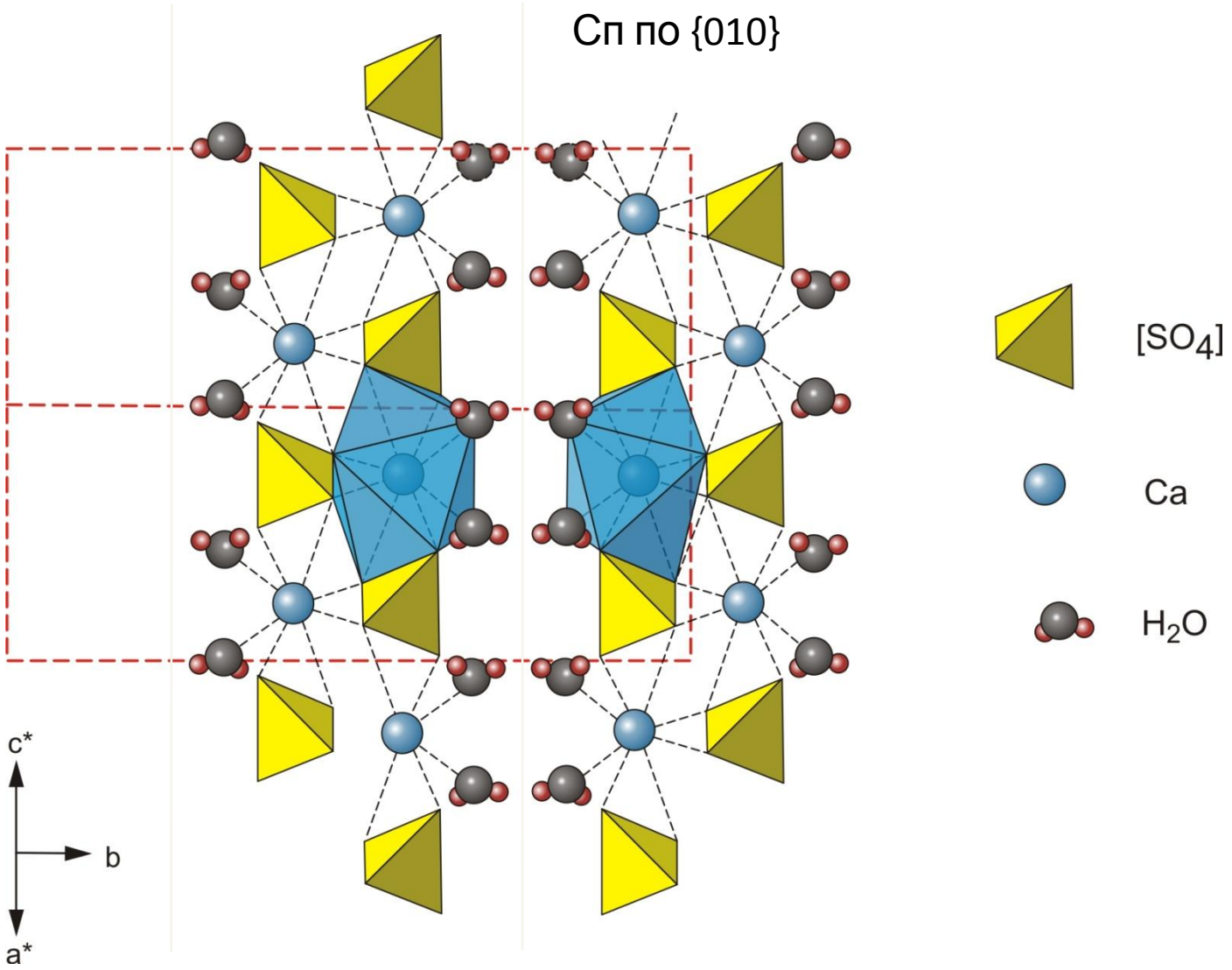

$[SO_4]$

K

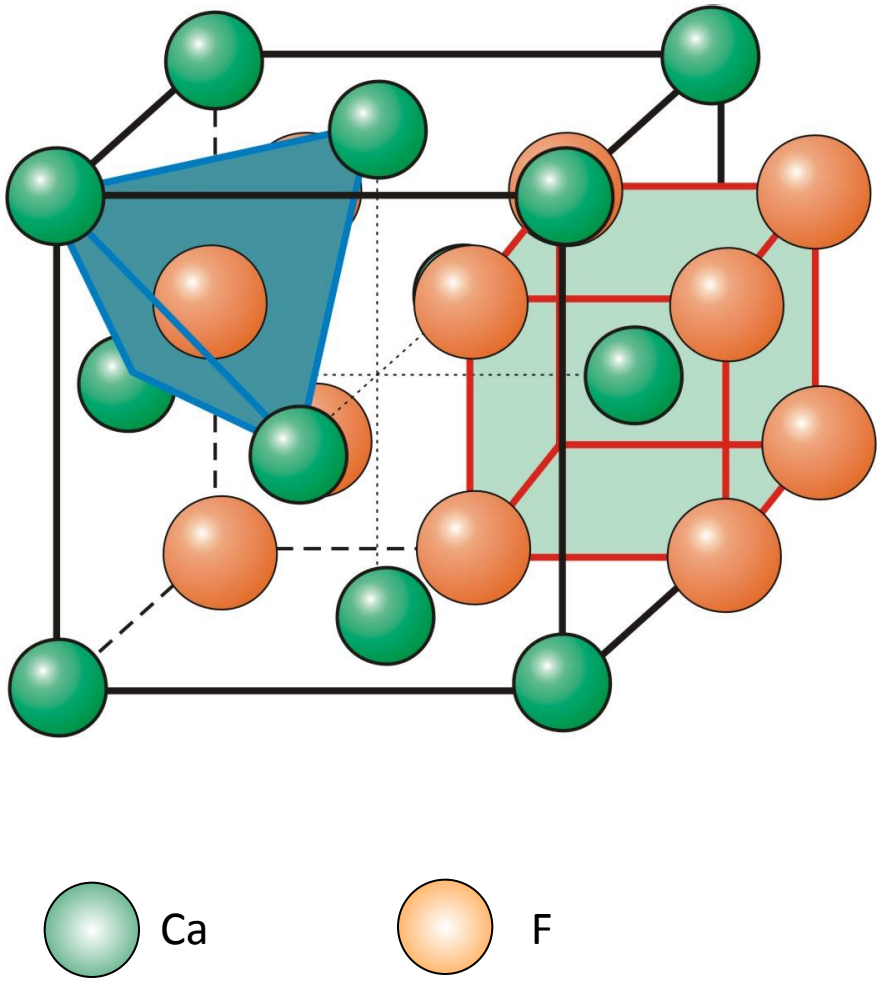
Al, Fe

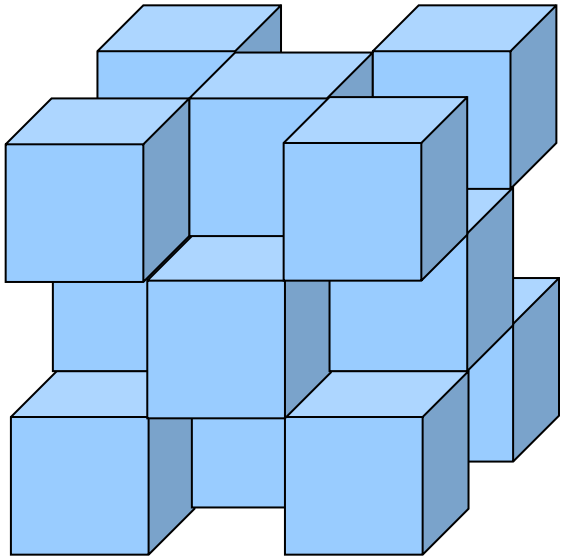


# Структура гипса

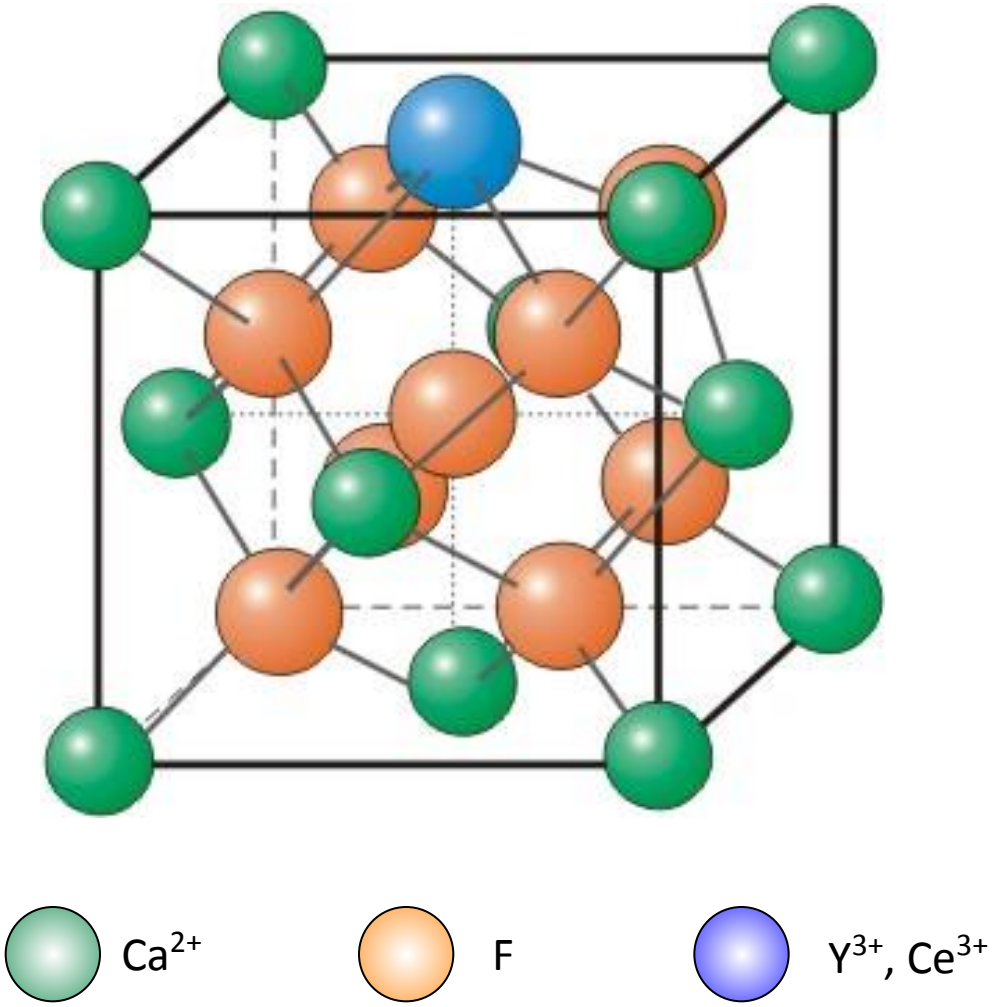


# Структура флюорита $CaF_2$, m3m

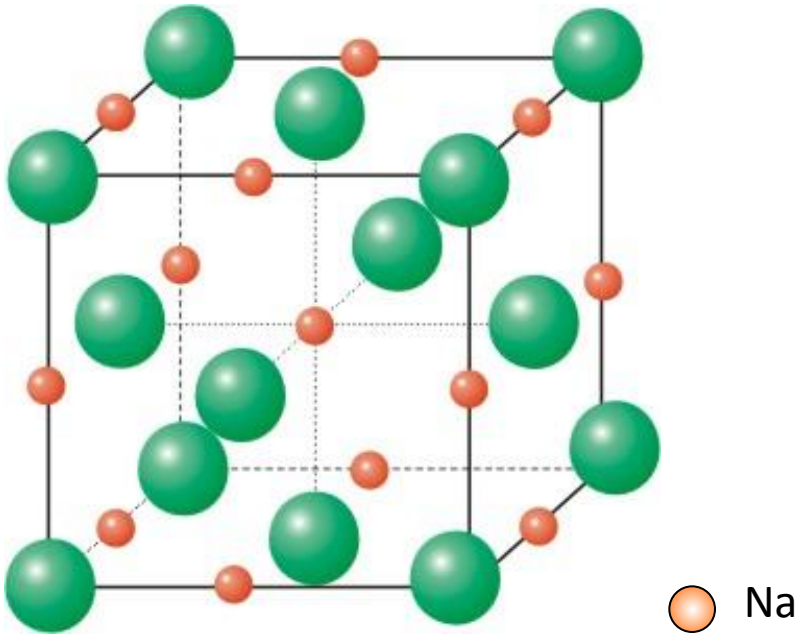


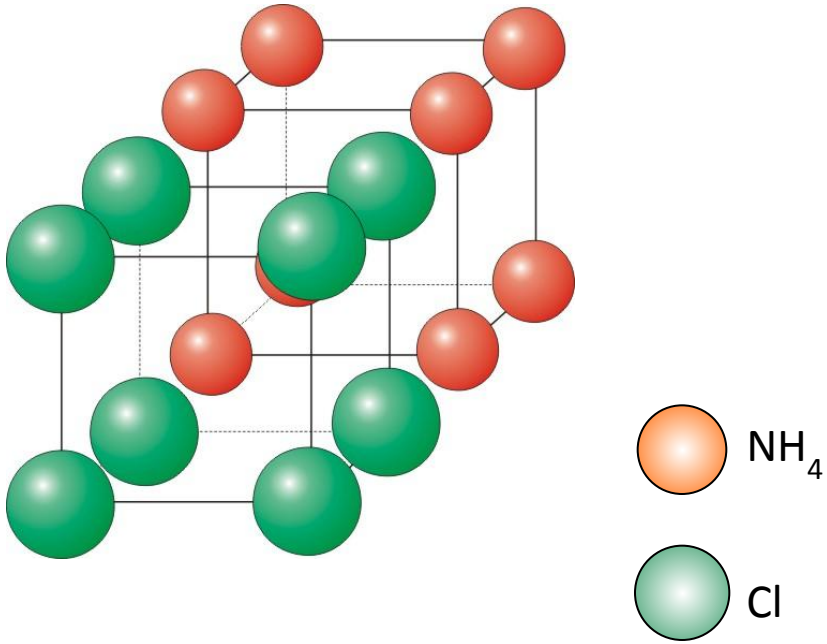



# Структура иттрофлюорита $(Ca,Y)F_{2-3}$



# Структуры хлоридов K, Na и $NH_4^+$

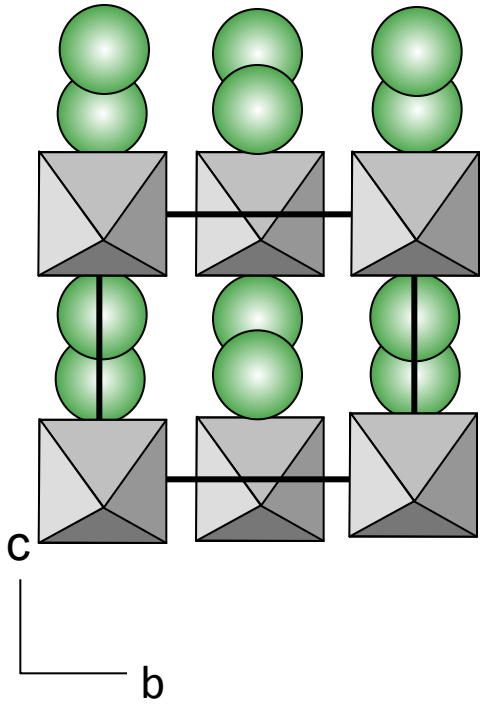


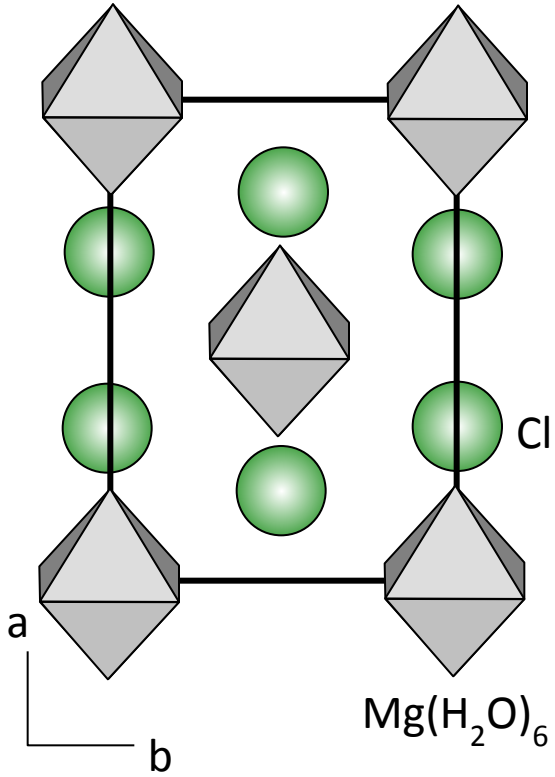




- Галит NaCl, *куб*. m3m
  Сильвин KCl, *куб*. m3m
- структурный тип NaCl

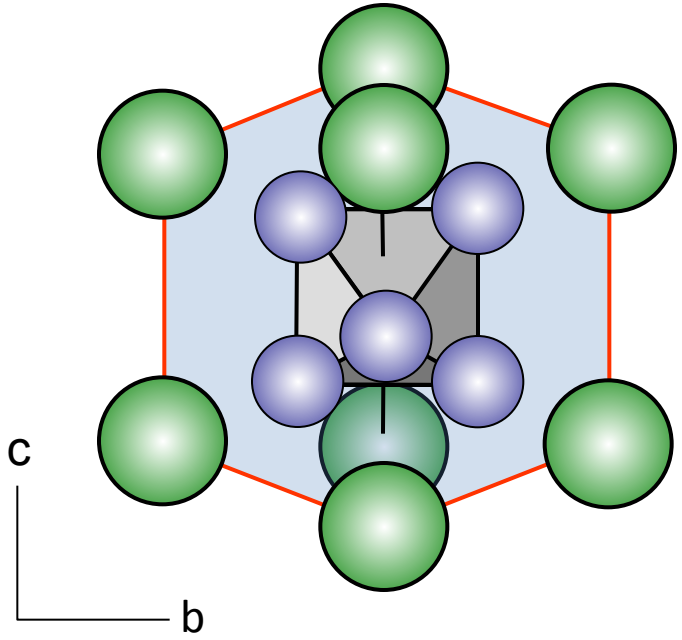
- Нашатырь $NH_4Cl$, *куб*. m3m
- структурный тип CsCl

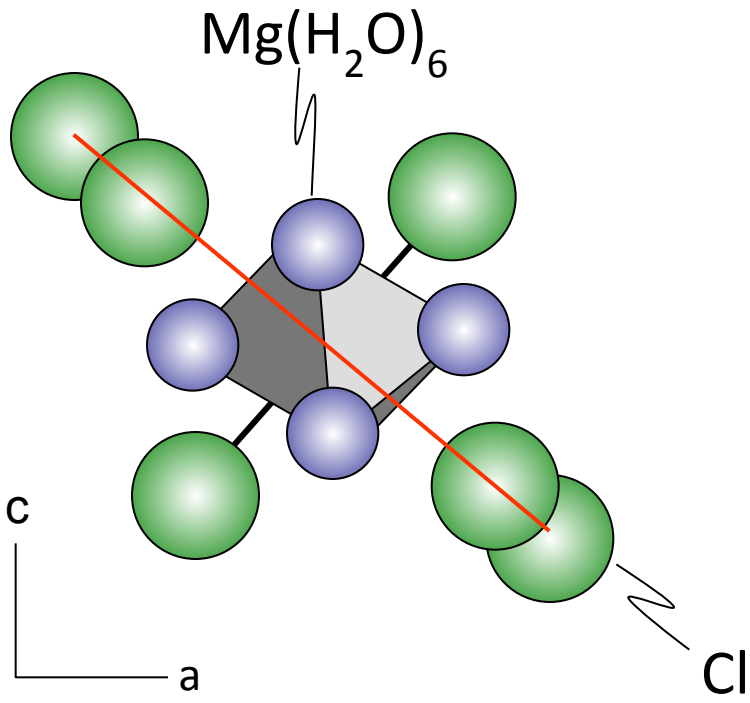
# Бишофит $MgCl_2 \cdot 6H_2O$ *мон.*, 2/m



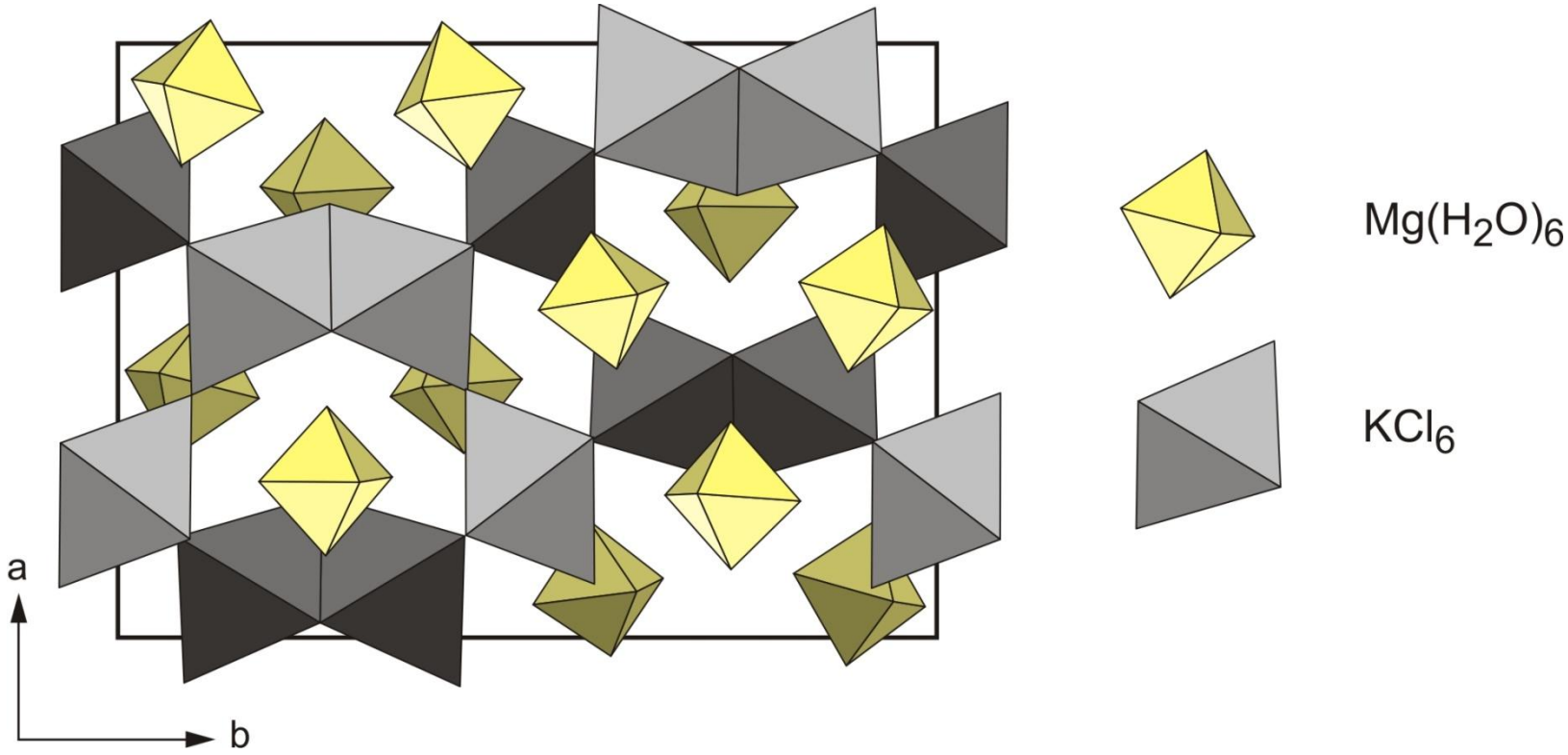



# Структура бишофита $MgCl_2 \cdot 6H_2O$



# Карналлит $KMgCl_3 \cdot 6H_2O$, *ромб*. mmm




темные полиэдры образуют нижний субслой, светлые - верхний