

# PIROXENOAK-ANFIBOLAK

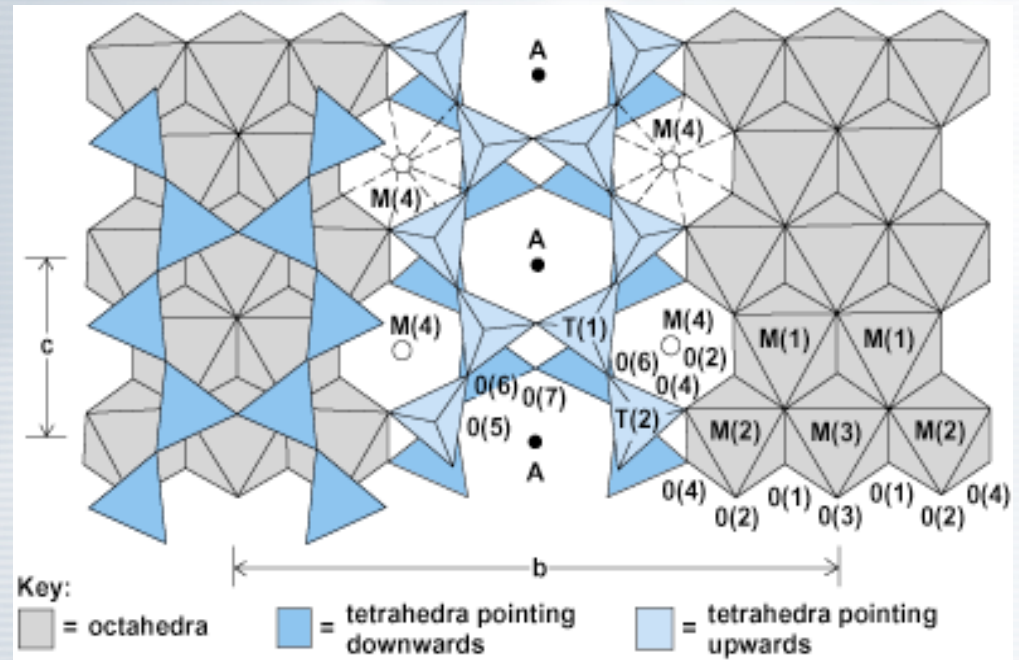
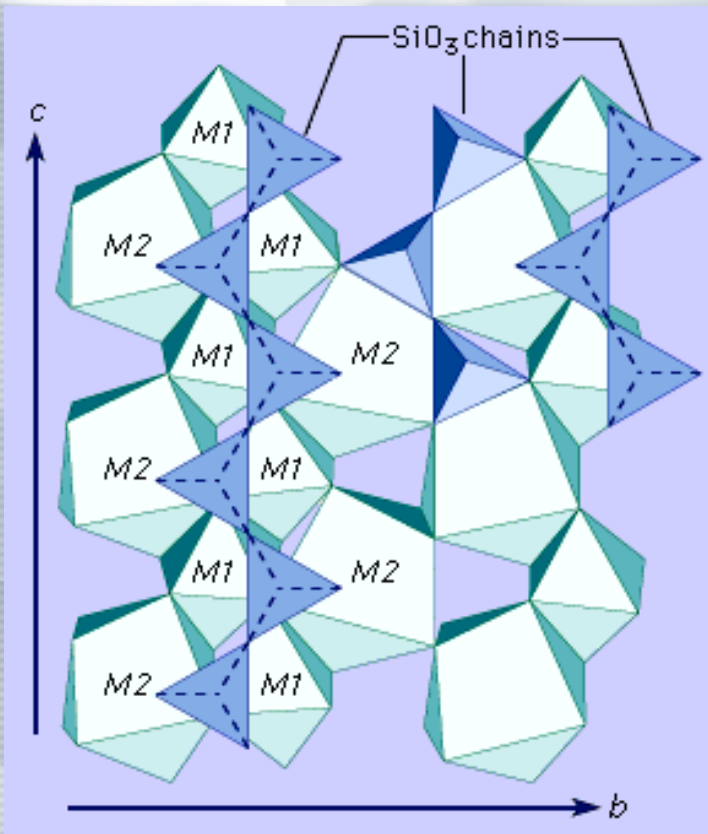
## PIROXENOAK: $ABZ_2O_6$

### Kate bakuna

**A** = Ca,  $Fe^{2+}$ , Li, Mg,  $Mn^{2+}$ , Na, Zn

**B** = Al,  $Cr^{3+}$ ,  $Fe^{2+}$ ,  $Fe^{3+}$ , Mg,  $Mn^{2+}$ ,

**Z** = Al, Si



## ANFIBOLAK: $A_{0-1}B_2Y_5Z_8O_{22}(OH,F,Cl)_2$

### Kate bikoitza

**A** = Ca, Na, K, Pb

**B** = Ca,  $Fe^{2+}$ , Li, Mg,  $Mn^{2+}$ , Na

**Y** = Al,  $Cr^{3+}$ ,  $Fe^{2+}$ ,  $Fe^{3+}$ , Mg,  $Mn^{2+}$ , Ti

**Z** = Al, Be, Si, Ti



# PIROXENOAK

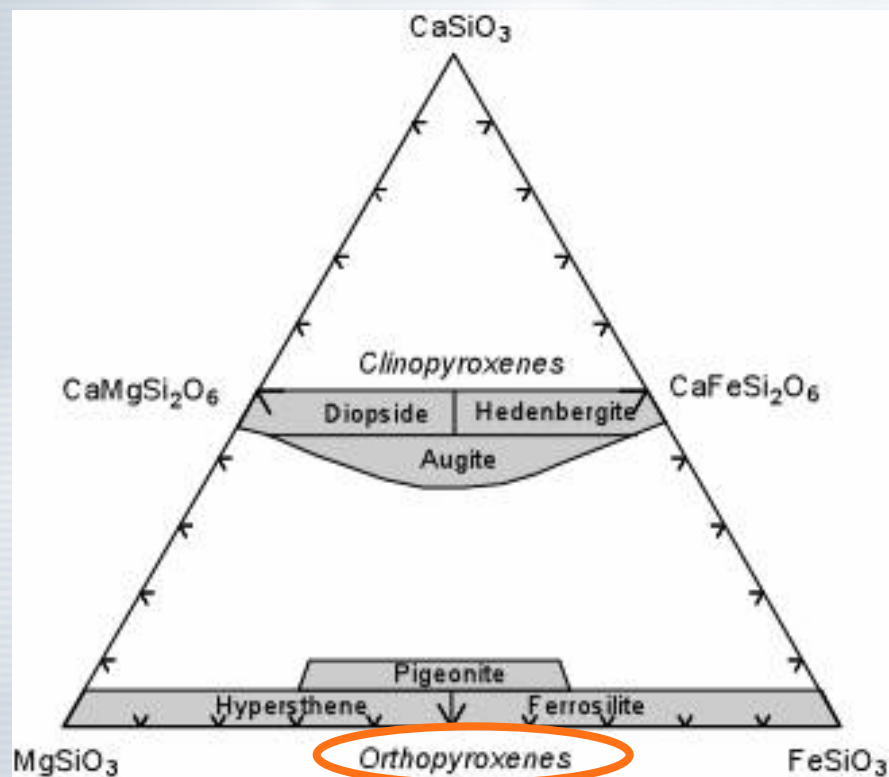
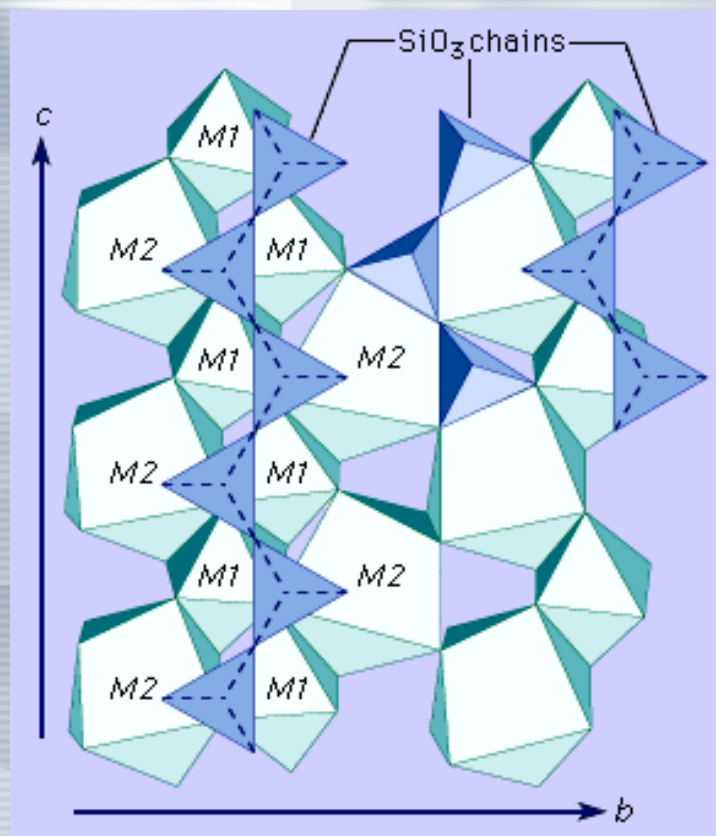


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B= Al,  $Cr^{3+}$ ,  $Fe^{2+}$ ,  $Fe^{3+}$ , Mg,  $Mn^{2+}$ ,

Z= Al, Si



Enstatita  $MgSiO_3$  – Ferrosilita  $FeSiO_3$

Mg eta Fe: M2 eta M1 hutsuneetan  
ORTORRONBIKOAK



# PIROXENOAK

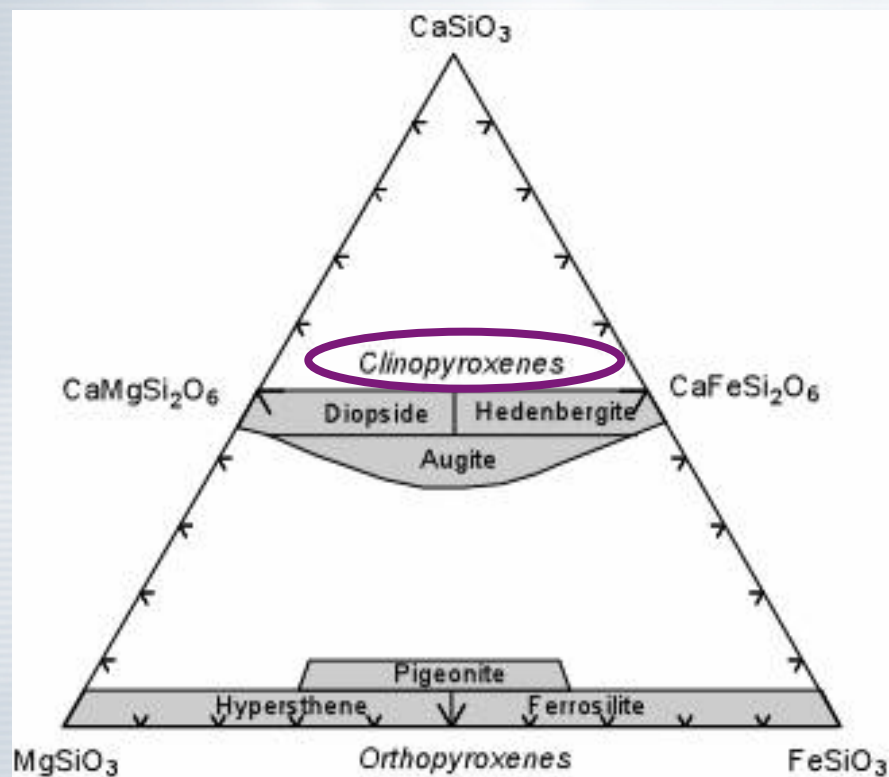
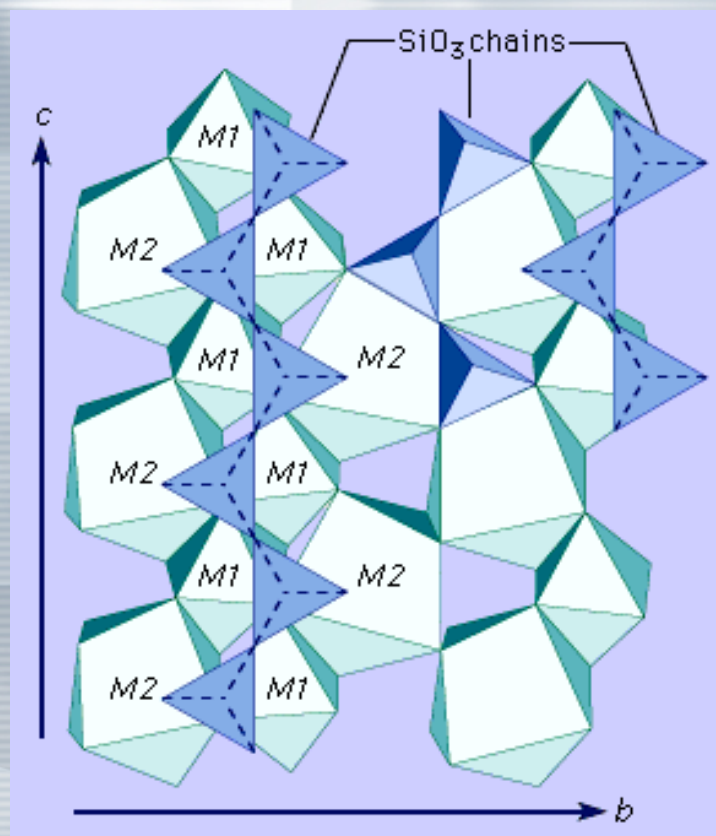


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Z= Al, Si



Diopside  $CaMgSi_2O_6$  - Hedenbergite  $CaFeSi_2O_6$

Augite  $Ca(Mg,Fe,Al)Si_2O_6$

Jadeite  $NaAlSi_2O_6$ ;

Egirina  $NaFeSi_2O_6$ ;

Espodumena  $LiAlSi_2O_6$

Ca, Na, Li: M2 hutsuneetan

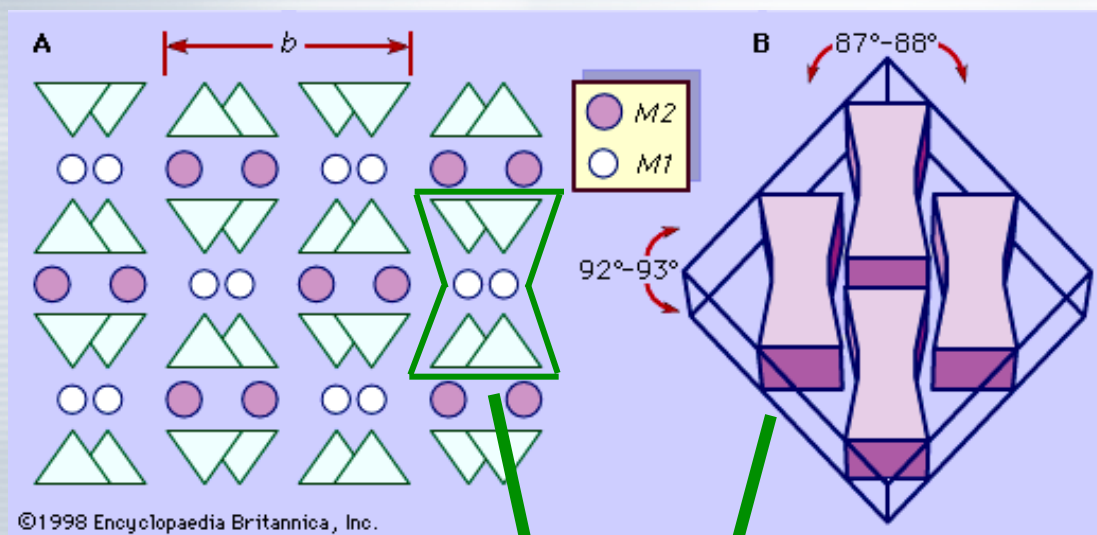
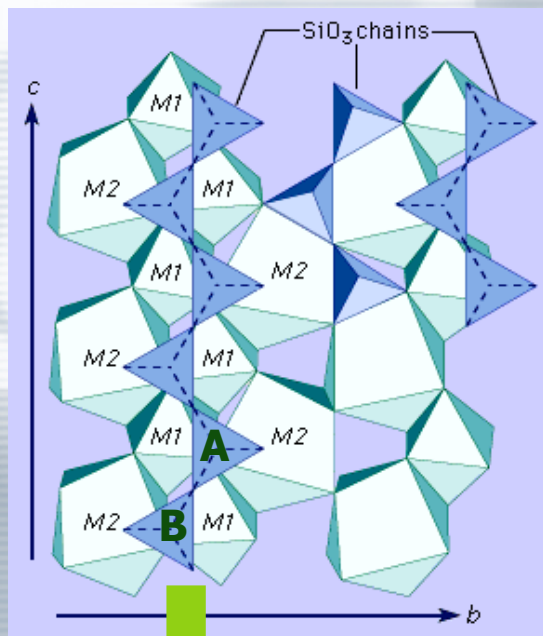
Mg, Fe, Al: M1 hutsuneetan

**MONOKLINIKOAK**



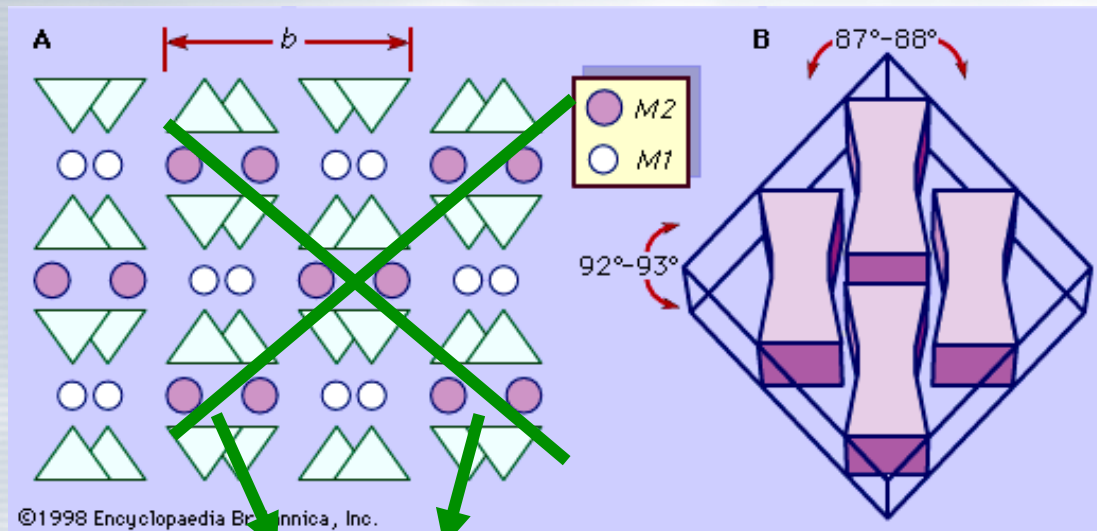
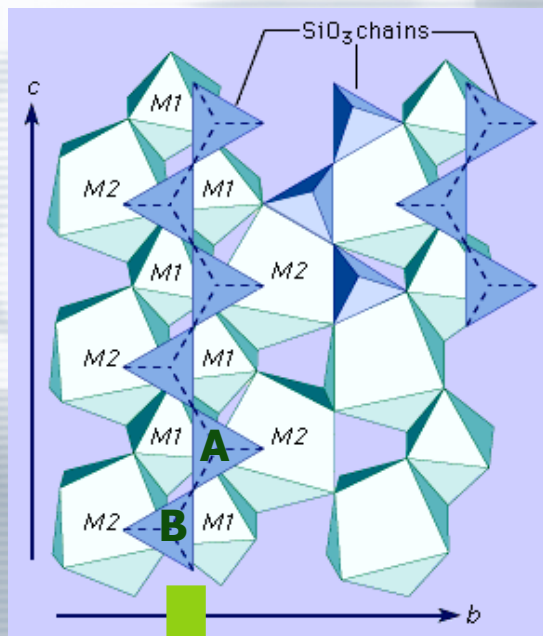


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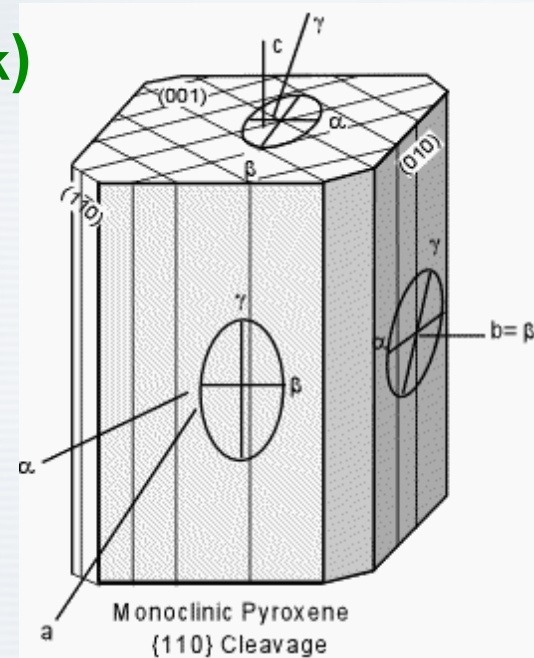
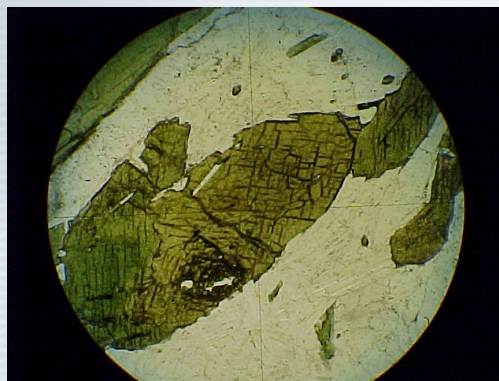
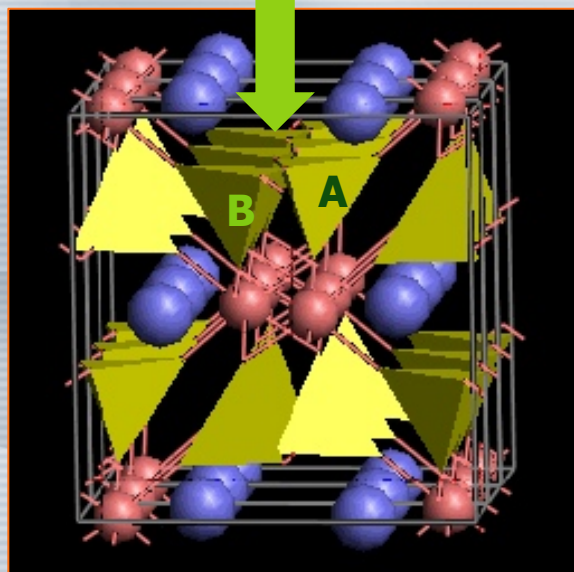


e-beam

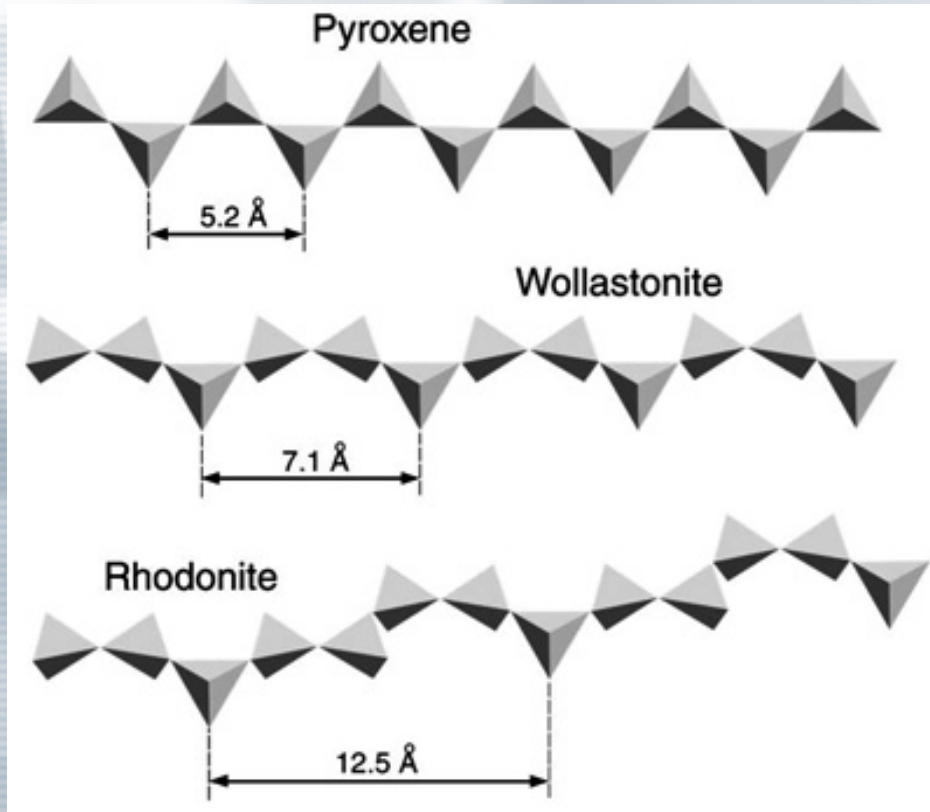
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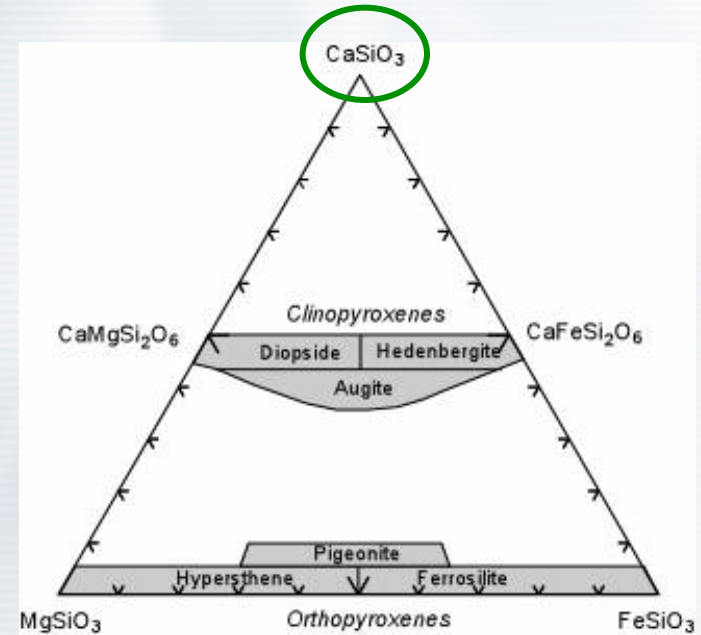
**Exfoliazio bikoitza**  
(ia perpendikularrak)



# PIROXENOIDEAK



## Wollastonita



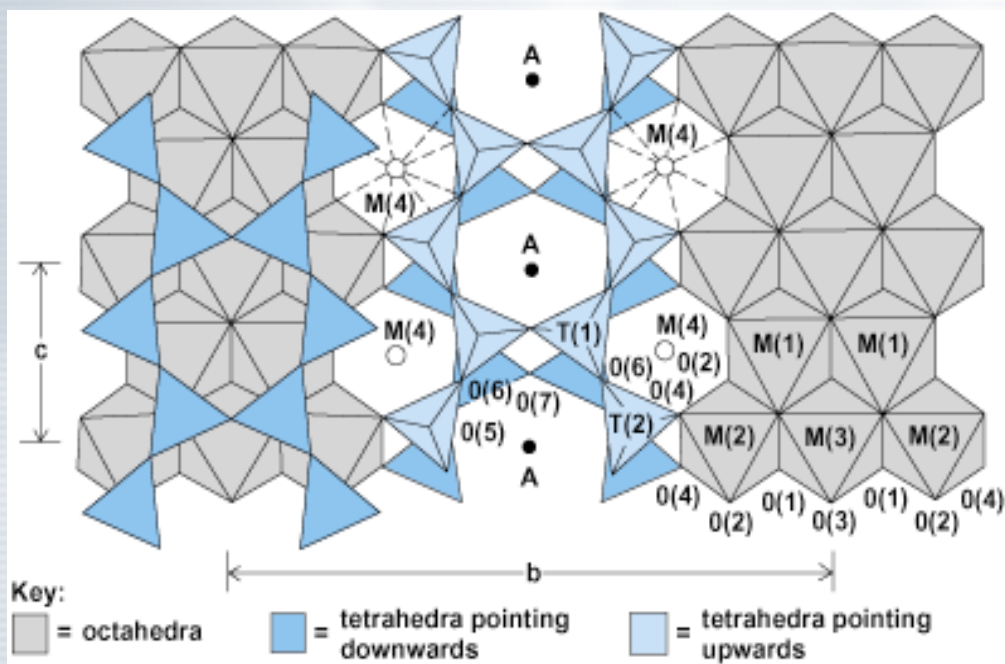
**WOLLASTONITA** mineral METAMORFIKOA da:





# ANFIBOLAK

A	M4	M123	Name
□	Mg	Mg	Anthophyllite
□	Fe	Mg	Cummingtonite
□	Fe	Fe	Grunerite
□	Ca	Mg	Tremolite
□	Ca	Fe	Ferroactinolite
□	Ca, Na	Mg, Fe <sup>2+</sup> , Mn, Al, Fe <sup>3+</sup> , Ti	Hornblende
□	Na	Mg, Al	Glaucophane
□	Na	Fe <sup>2+</sup> , Fe <sup>3+</sup>	Riebeckite
Na	Na	Fe <sup>2+</sup> , Fe <sup>3+</sup>	Afrvedsonite



**ANFIBOLAK:**  $A_{0-1}B_2Y_5Z_8O_{22}(OH,F,Cl)_2$

**Kate bikoitza**

**A** = Ca, Na, K, Pb

**B** = Ca, Fe<sup>2+</sup>, Li, Mg, Mn<sup>2+</sup>, Na

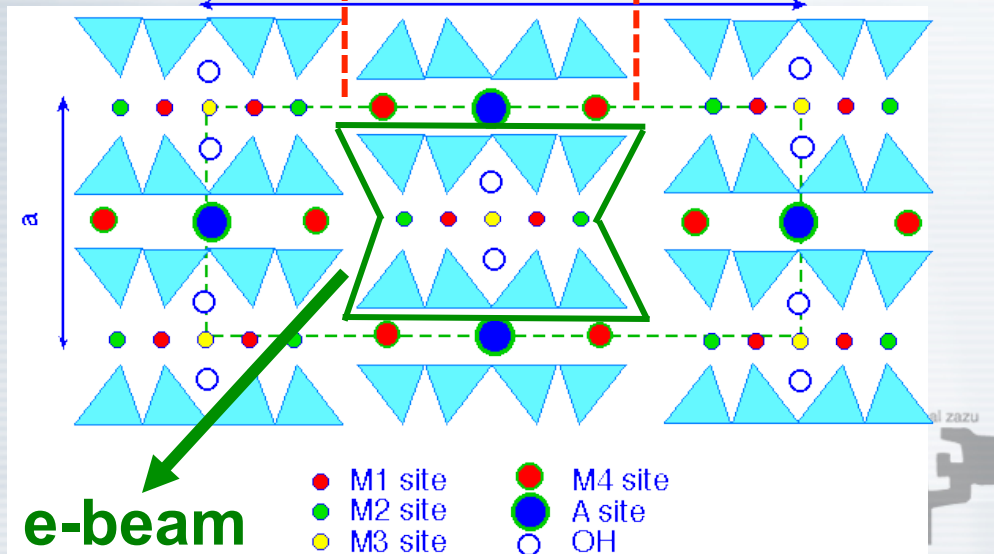
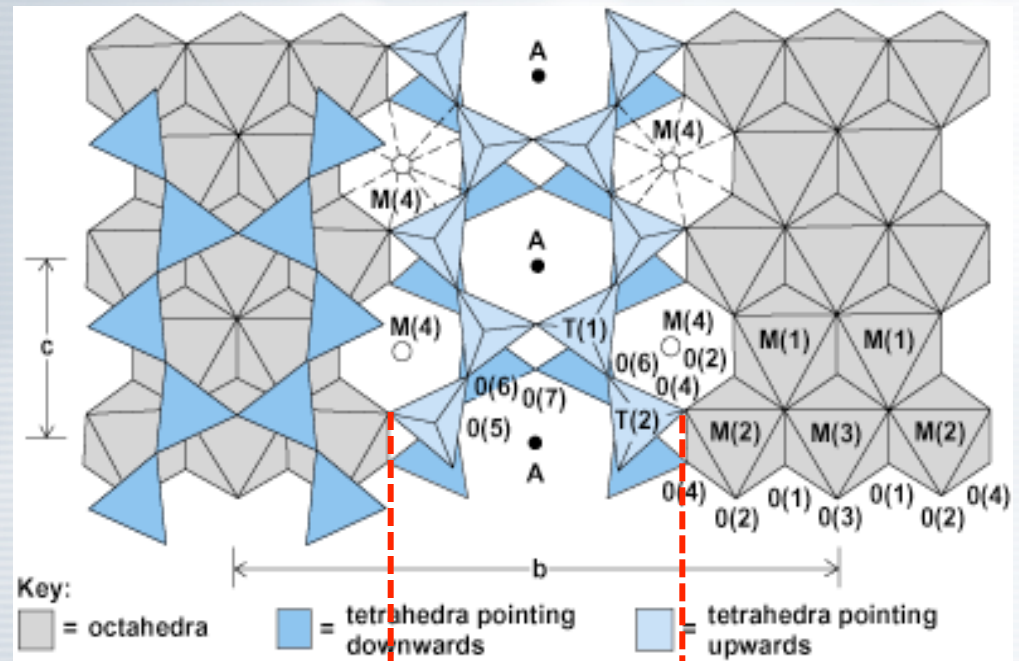
**Y** = Al, Cr<sup>3+</sup>, Fe<sup>2+</sup>, Fe<sup>3+</sup>, Mg, Mn<sup>2+</sup>, Ti

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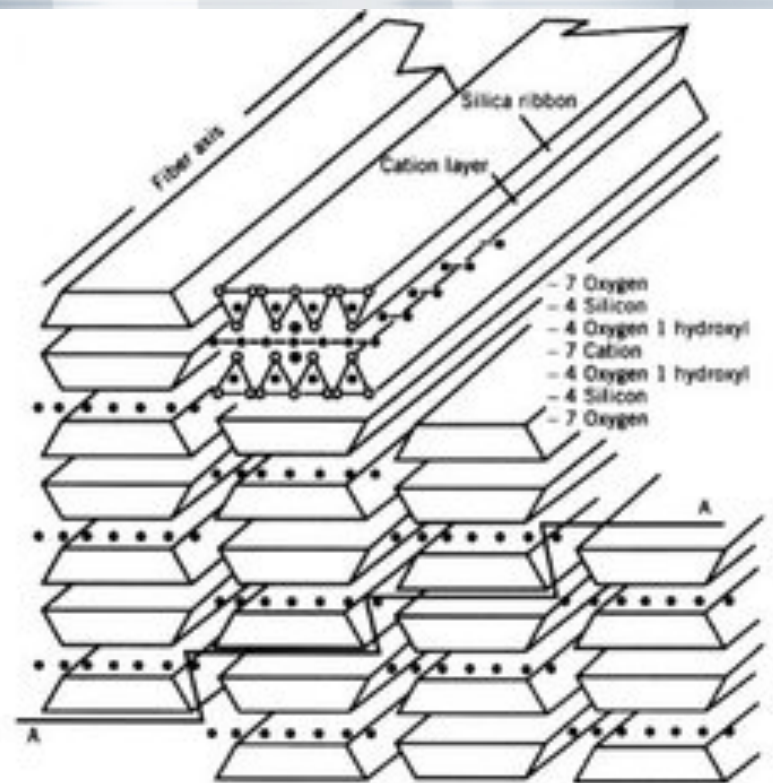
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Na	Na	Fe <sup>2+</sup> , Fe <sup>3+</sup>	Afrvedsonite

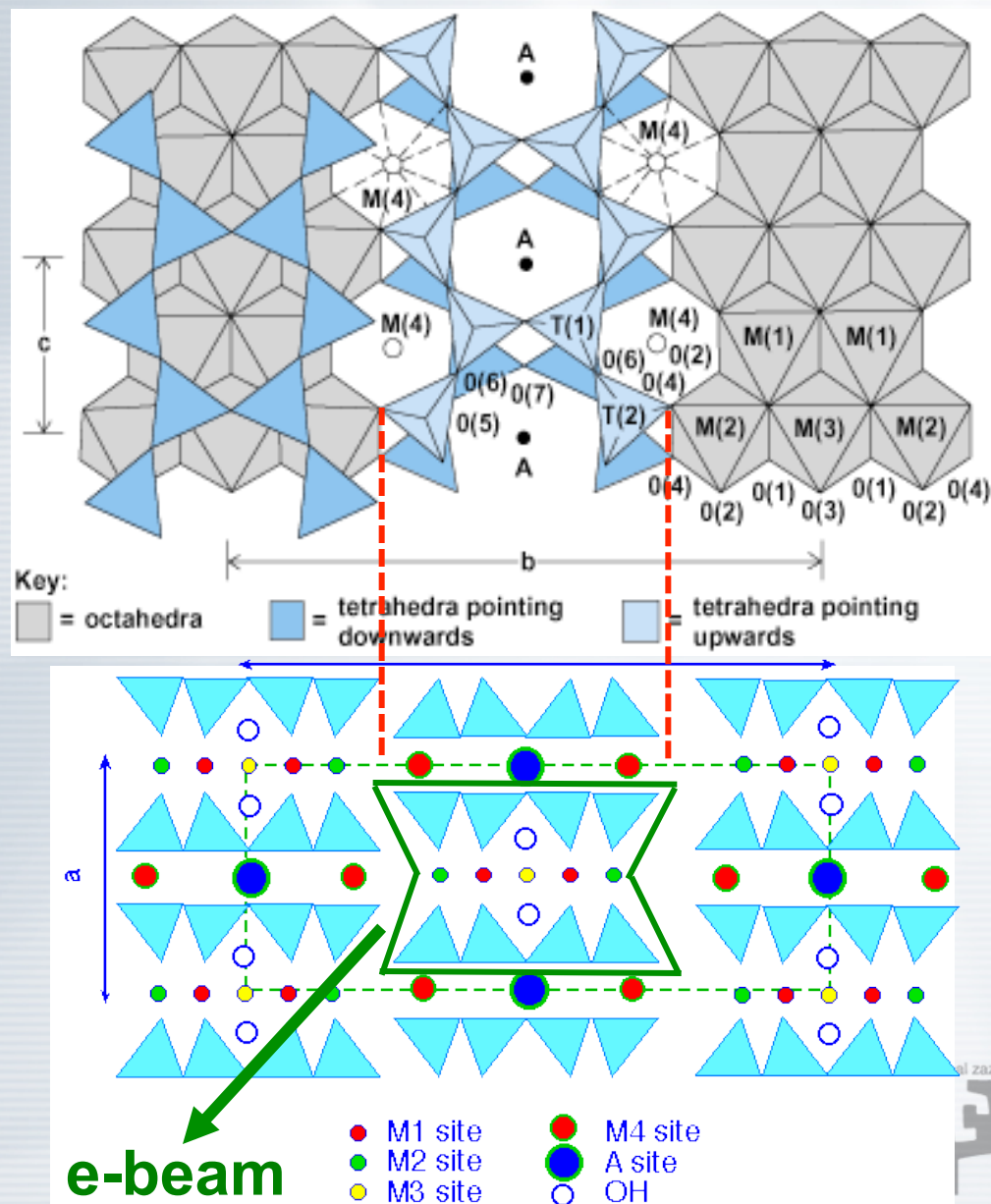




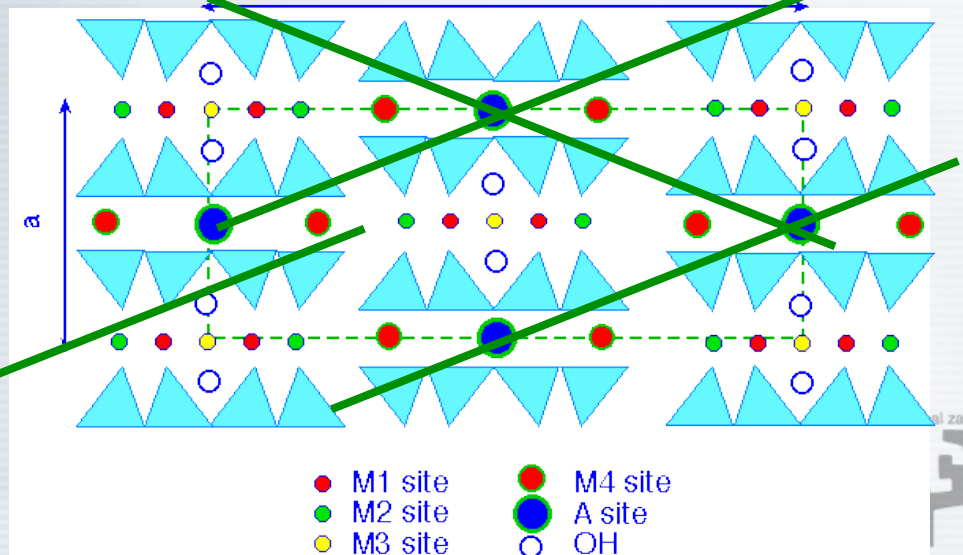
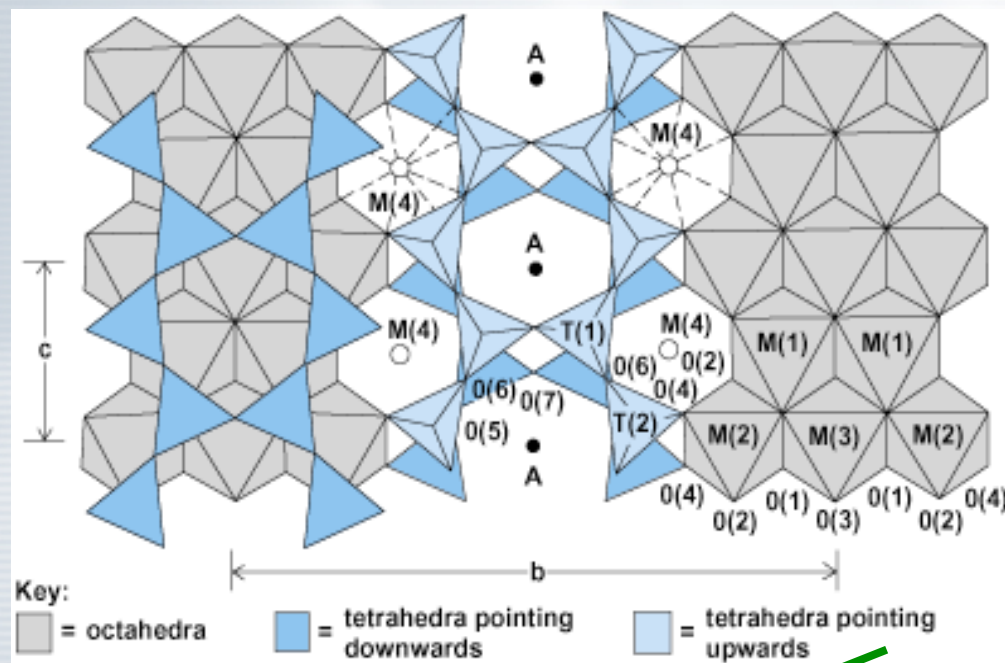
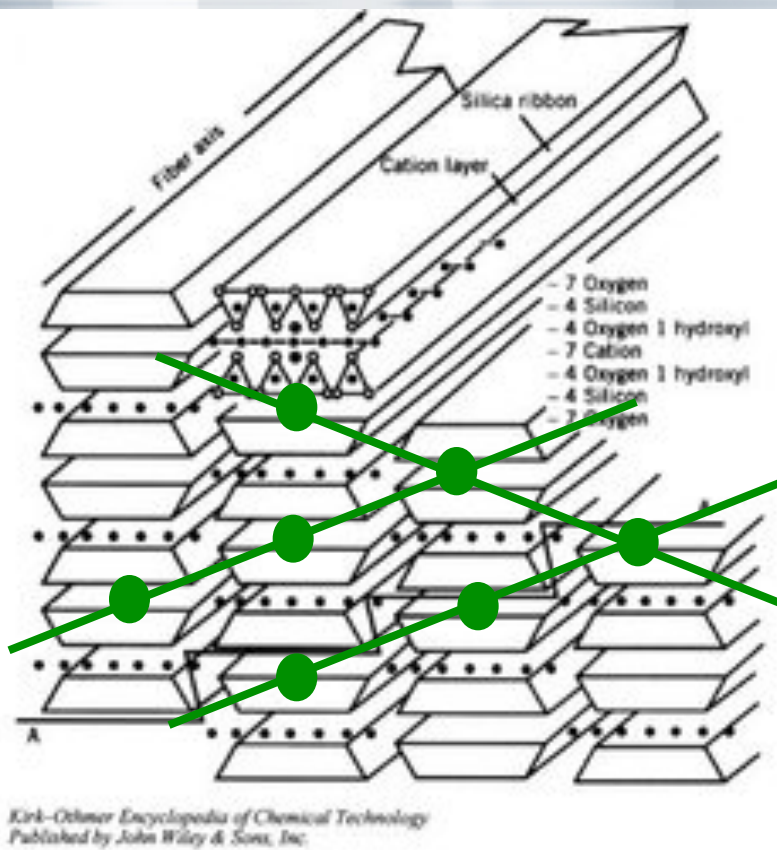
## ANFIBOLAK



Kirk-Othmer Encyclopedia of Chemical Technology  
Published by John Wiley & Sons, Inc.



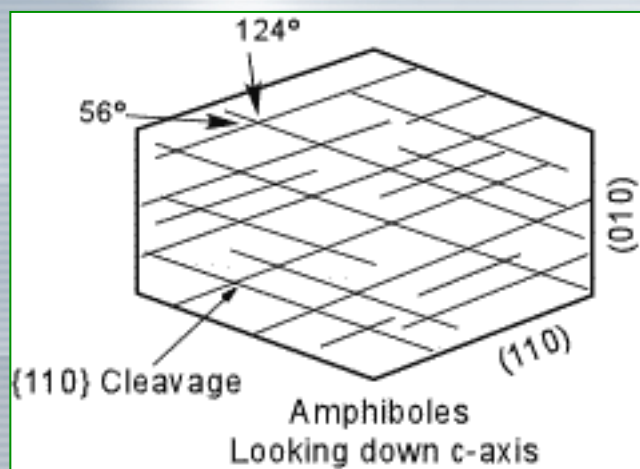
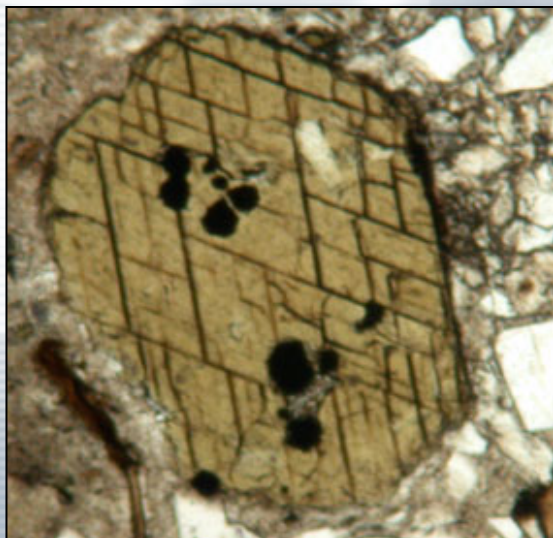
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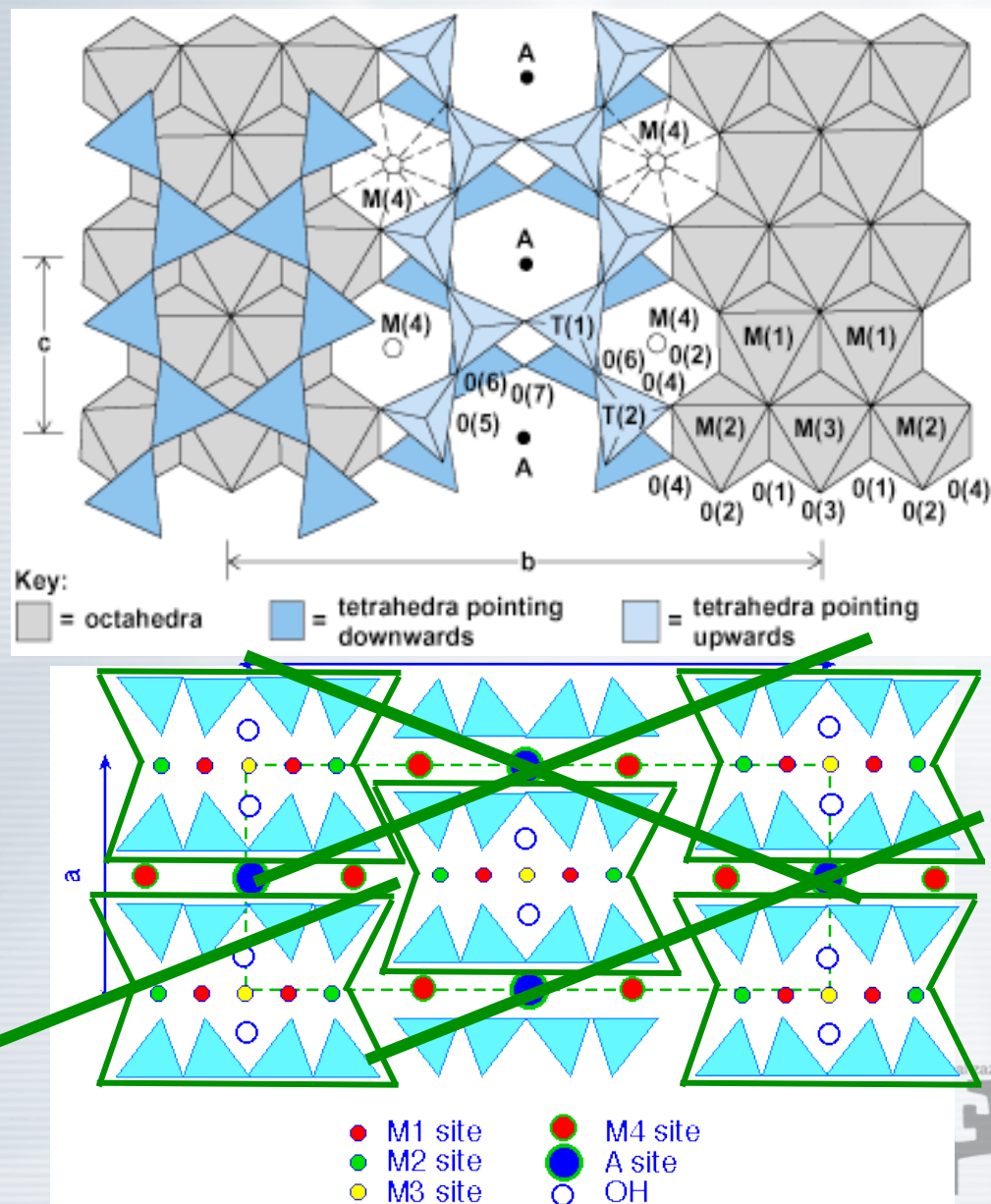
Exfoliazio bikoitza  
(56°-124°)



## ANFIBOLAK



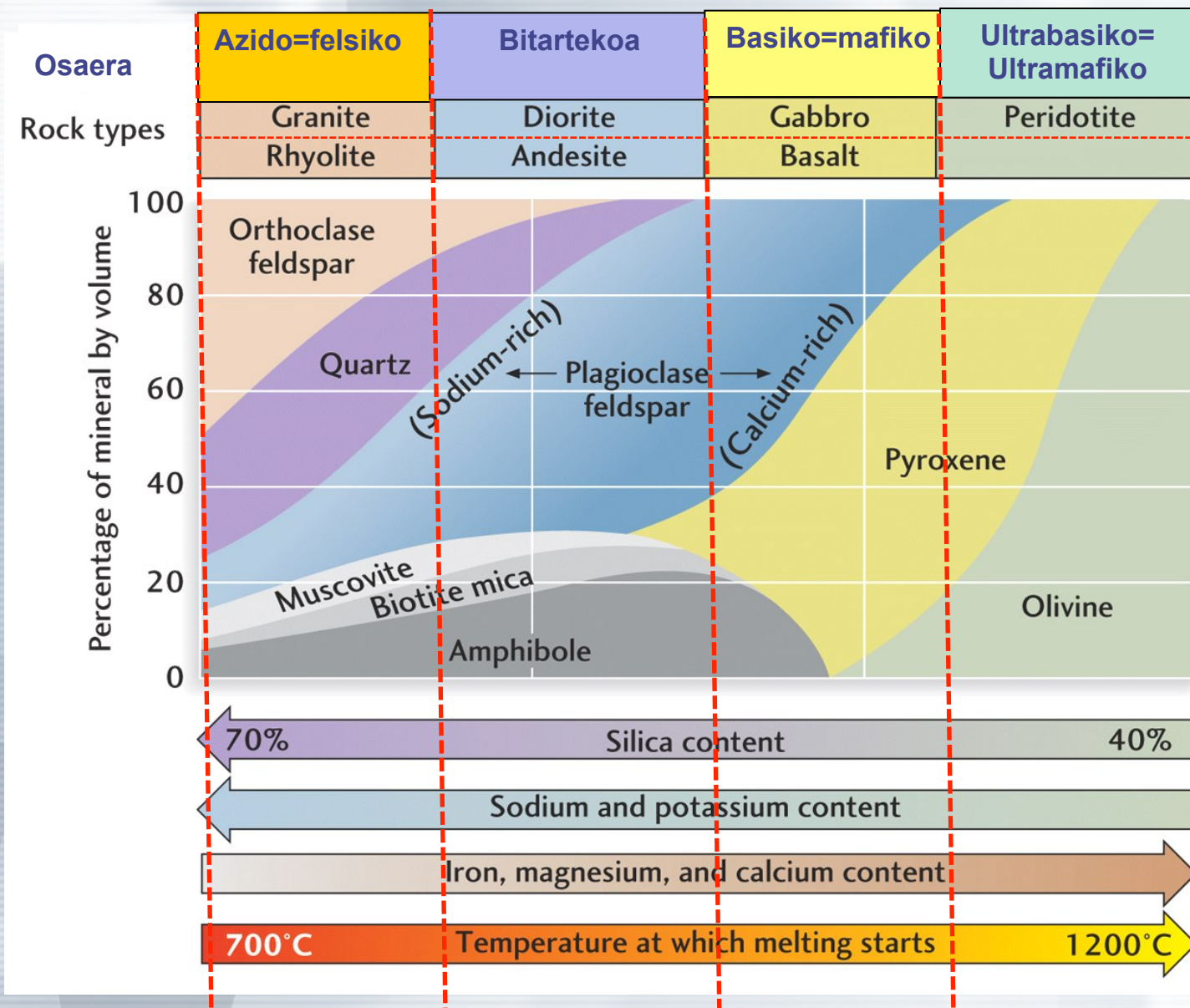
**Exfoliazio bikoitza**  
( $56^\circ$ - $124^\circ$ )





# PIROXENOAK-ANFIBOLAK

PLUTONIKOAK  
BOLKANIKOAK



# PIROXENOAK-ANFIBOLAK

- \* **ETA ARROKA SEDIMENTARIOETAN?**
- \* **ETA ARROKA METAMORFIKOETAN?**
- \* **ALTERATZEN DIRA?**

**Zein piroxeno aurki ditzakegu marmoletan?**

**Piroxenoak zein mineraletara altera daitezke?**

**Anfibolak alterazio-produktuak izan daitezke?**