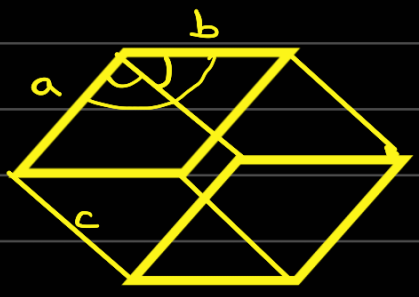
Day – 5

→ Revision:



$a \neq b \neq c$

$\alpha \neq \beta \neq \gamma \neq 90°$

aP ⟶ Primitive

↓

anorthic

(Triclinic)

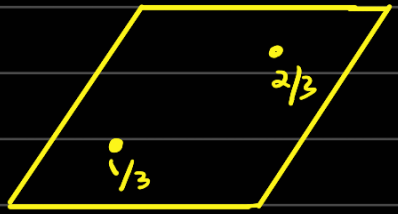
"n-clinic" means n angles $\neq 90°$

[Bi-clinic doesn't exist]

monoclinic (mP) ← diad — aP

↓

only one angle $\neq 90°$

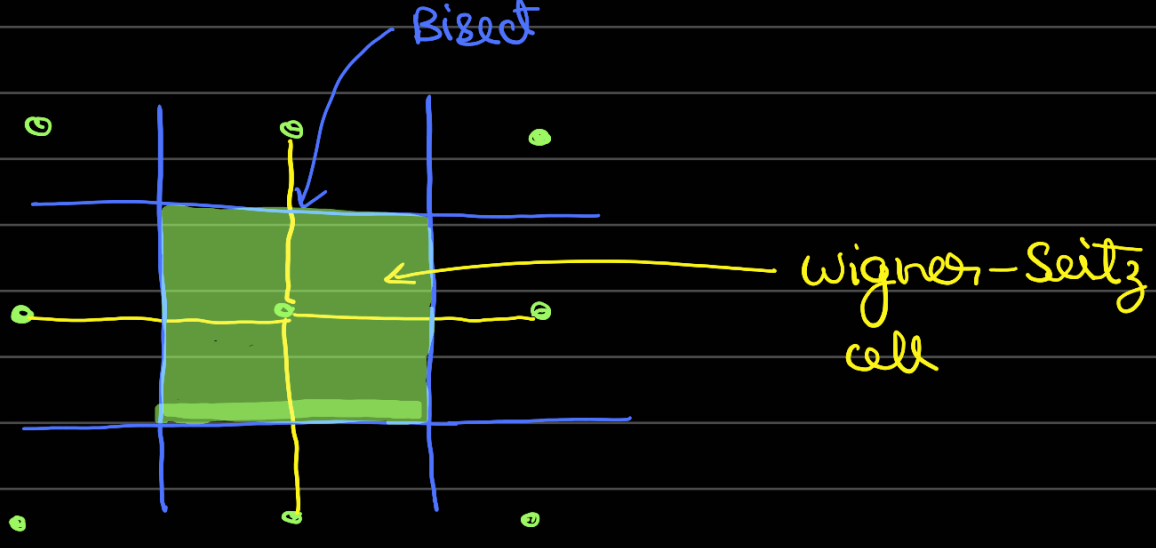


⟶ hR (triad)

- more symmetry → more entropy

→ Centred lattice: Can we find a primitive cell which reflects the symmetry of the lattice?

→ Wigner – Seitz cell:



→ Non-orthonormal basis:

(2, 0, 0) (1, 1, 1)

Lattice point coordinates.

$$\text{Distance} = \|[200] - [111]\|$$

$$= \sqrt{([200]-[111]) \cdot ([200]-[111])}$$

$$= \sqrt{([1\ -1\ -1]) \cdot ([1\ -1\ -1])}$$

[Here $\vec{a}.\vec{b} \neq 0$, $\vec{b}.\vec{c} \neq 0$, $\vec{c}.\vec{a} \neq 0$]

→ Angle:

$$\theta = \cos^{-1}\left(\frac{2_i\, g_{ij}\, P_j}{\sqrt{2_i g_{ij} 2_j}\ \sqrt{P_i g_{ij} P_j}}\right)$$