

Cc

C_s^4

m

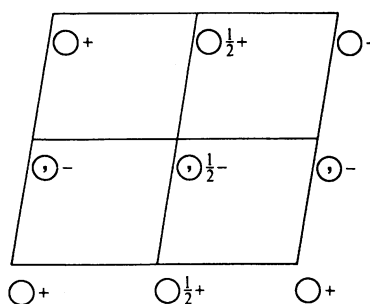
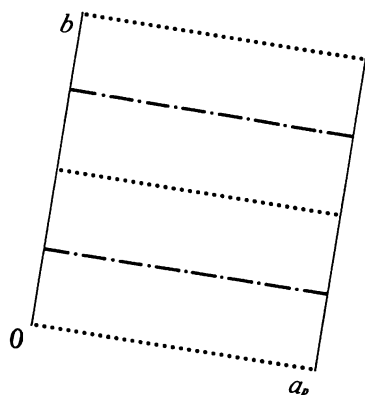
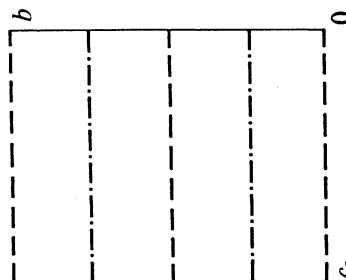
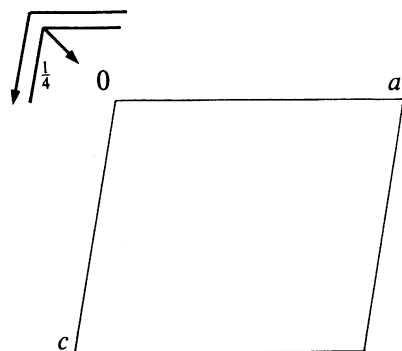
Monoclinic

No. 9

$C1c1$

Patterson symmetry $C12/m1$

UNIQUE AXIS b , CELL CHOICE 1



Origin on glide plane c

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq \frac{1}{4}; 0 \leq z \leq 1$

Symmetry operations

For $(0,0,0)+$ set

- (1) 1
- (2) $c \ x, 0, z$

For $(\frac{1}{2}, \frac{1}{2}, 0)+$ set

- (1) $t(\frac{1}{2}, \frac{1}{2}, 0)$
- (2) $n(\frac{1}{2}, 0, \frac{1}{2}) \ x, \frac{1}{4}, z$

Generators selected (1); $t(1,0,0); t(0,1,0); t(0,0,1); t(\frac{1}{2}, \frac{1}{2}, 0);$ (2)

Positions

| Multiplicity, Wyckoff letter, Site symmetry | Coordinates |
|---|---|
| 4 a 1 | $(0,0,0)+ \ (\frac{1}{2}, \frac{1}{2}, 0)+$ |
| | (1) x, y, z (2) $x, \bar{y}, z + \frac{1}{2}$ |

Reflection conditions

General:

- $hkl: h+k=2n$
- $h0l: h, l=2n$
- $0kl: k=2n$
- $hk0: h+k=2n$
- $0k0: k=2n$
- $h00: h=2n$
- $00l: l=2n$

Symmetry of special projections

Along $[001] \ c11m$

$\mathbf{a}' = \mathbf{a}_p \quad \mathbf{b}' = \mathbf{b}$

Origin at $0,0,z$

Along $[100] \ p1g1$

$\mathbf{a}' = \frac{1}{2}\mathbf{b} \quad \mathbf{b}' = \mathbf{c}_p$

Origin at $x,0,0$

Along $[010] \ p1$

$\mathbf{a}' = \frac{1}{2}\mathbf{c} \quad \mathbf{b}' = \frac{1}{2}\mathbf{a}$

Origin at $0,y,0$

Monoclinic

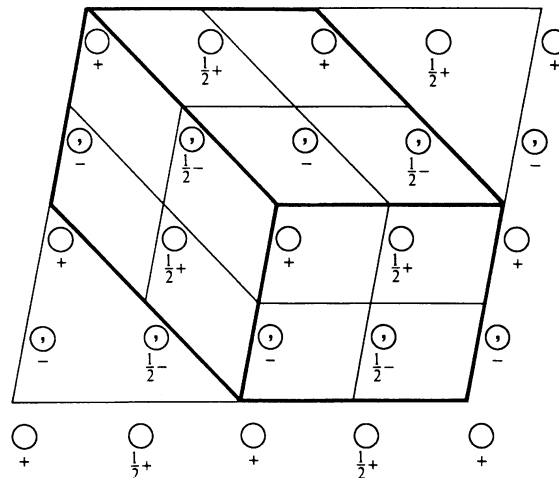
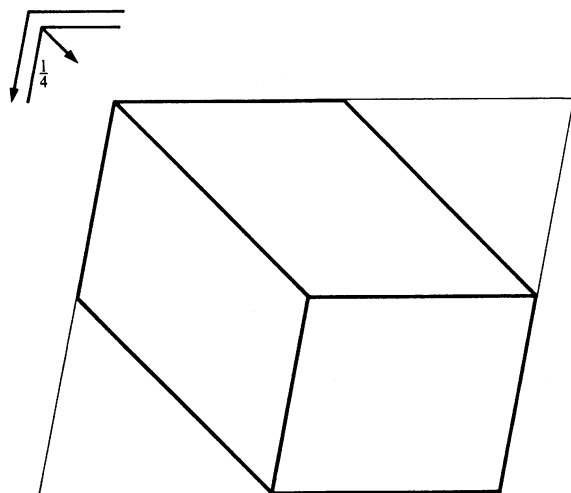
m

C_s^4

Cc

No. 9

UNIQUE AXIS b , DIFFERENT CELL CHOICES



$C1c1$

UNIQUE AXIS b , CELL CHOICE 1

Origin on glide plane c

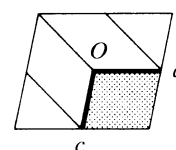
Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq \frac{1}{4}; 0 \leq z \leq 1$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(\frac{1}{2}, \frac{1}{2}, 0)$; (2)

Positions

| Multiplicity, Wyckoff letter, Site symmetry | Coordinates |
|---|---|
| | $(0,0,0)+$ $(\frac{1}{2}, \frac{1}{2}, 0)+$ |

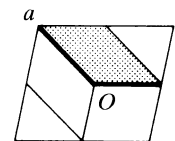
| | | | | |
|---|-----|---|---------------|-----------------------------------|
| 4 | a | 1 | (1) x, y, z | (2) $x, \bar{y}, z + \frac{1}{2}$ |
|---|-----|---|---------------|-----------------------------------|



Reflection conditions

General:

$hkl: h + k = 2n$
 $h0l: h, l = 2n$
 $0kl: k = 2n$
 $hk0: h + k = 2n$
 $0k0: k = 2n$
 $h00: h = 2n$
 $00l: l = 2n$

A1n1UNIQUE AXIS *b*, CELL CHOICE 2**Origin** on glide plane *n***Asymmetric unit** $0 \leq x \leq 1; 0 \leq y \leq \frac{1}{4}; 0 \leq z \leq 1$ **Generators selected** (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(0, \frac{1}{2}, \frac{1}{2})$; (2)**Positions**

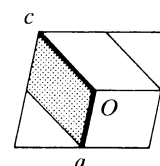
| Multiplicity, Wyckoff letter, Site symmetry | Coordinates |
|---|---|
| | $(0,0,0) + (0, \frac{1}{2}, \frac{1}{2}) +$ |

| | | | | |
|---|----------|---|---------------|---|
| 4 | <i>a</i> | 1 | (1) x, y, z | (2) $x + \frac{1}{2}, \bar{y}, z + \frac{1}{2}$ |
|---|----------|---|---------------|---|

Reflection conditions

General:

$hkl: k + l = 2n$
 $h0l: h, l = 2n$
 $0kl: k + l = 2n$
 $hk0: k = 2n$
 $0k0: k = 2n$
 $h00: h = 2n$
 $00l: l = 2n$

I1a1UNIQUE AXIS *b*, CELL CHOICE 3**Origin** on glide plane *a***Asymmetric unit** $0 \leq x \leq 1; 0 \leq y \leq \frac{1}{4}; 0 \leq z \leq 1$ **Generators selected** (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$; (2)**Positions**

| Multiplicity, Wyckoff letter, Site symmetry | Coordinates |
|---|---|
| | $(0,0,0) + (\frac{1}{2}, \frac{1}{2}, \frac{1}{2}) +$ |

| | | | | |
|---|----------|---|---------------|-----------------------------------|
| 4 | <i>a</i> | 1 | (1) x, y, z | (2) $x + \frac{1}{2}, \bar{y}, z$ |
|---|----------|---|---------------|-----------------------------------|

Reflection conditions

General:

$hkl: h + k + l = 2n$
 $h0l: h, l = 2n$
 $0kl: k + l = 2n$
 $hk0: h + k = 2n$
 $0k0: k = 2n$
 $h00: h = 2n$
 $00l: l = 2n$

Monoclinic

m

C_s^4

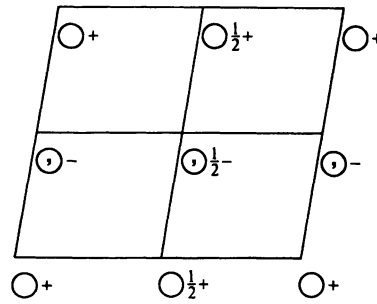
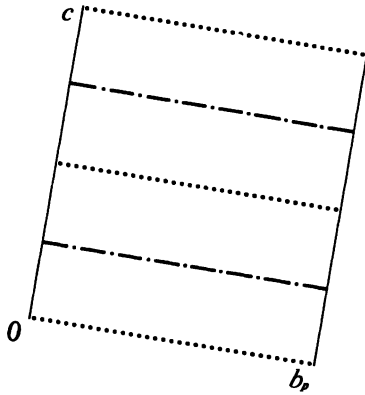
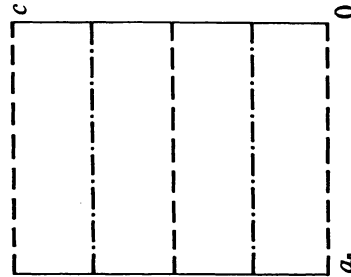
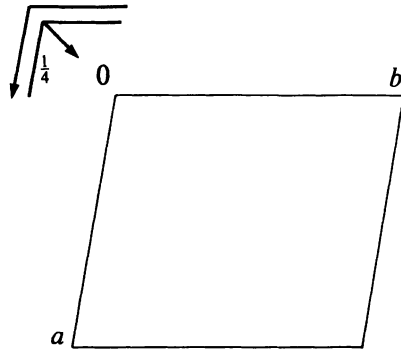
Cc

Patterson symmetry $A112/m$

$A11a$

No. 9

UNIQUE AXIS c , CELL CHOICE 1



Origin on glide plane a

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1; 0 \leq z \leq \frac{1}{4}$

Symmetry operations

For $(0,0,0)+$ set

- (1) 1 (2) a $x, y, 0$

For $(0, \frac{1}{2}, \frac{1}{2})+$ set

- (1) $t(0, \frac{1}{2}, \frac{1}{2})$ (2) $n(\frac{1}{2}, \frac{1}{2}, 0)$ $x, y, \frac{1}{4}$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(0, \frac{1}{2}, \frac{1}{2})$; (2)

Positions

| Multiplicity, Wyckoff letter, Site symmetry | Coordinates |
|---|---|
| 4 a 1 | $(0,0,0)+$ $(0, \frac{1}{2}, \frac{1}{2})+$ |
| | (1) x, y, z (2) $x + \frac{1}{2}, y, \bar{z}$ |

Reflection conditions

General:

- hkl : $k+l=2n$
 $hk0$: $h, k=2n$
 $0kl$: $k+l=2n$
 $h0l$: $l=2n$
 $00l$: $l=2n$
 $h00$: $h=2n$
 $0k0$: $k=2n$

Symmetry of special projections

Along $[001]$ $p1$
 $\mathbf{a}' = \frac{1}{2}\mathbf{a}$ $\mathbf{b}' = \frac{1}{2}\mathbf{b}$
 Origin at $0,0,z$

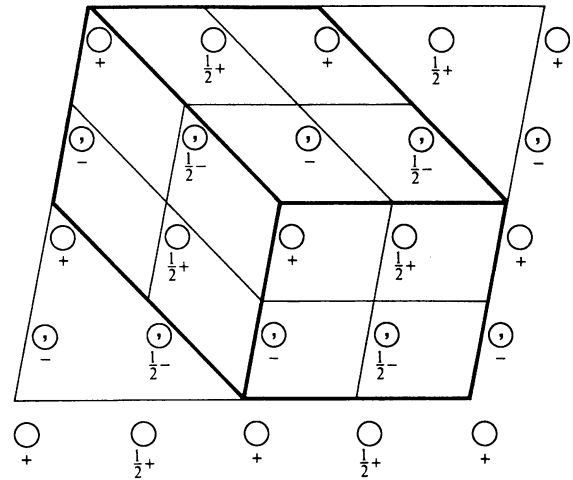
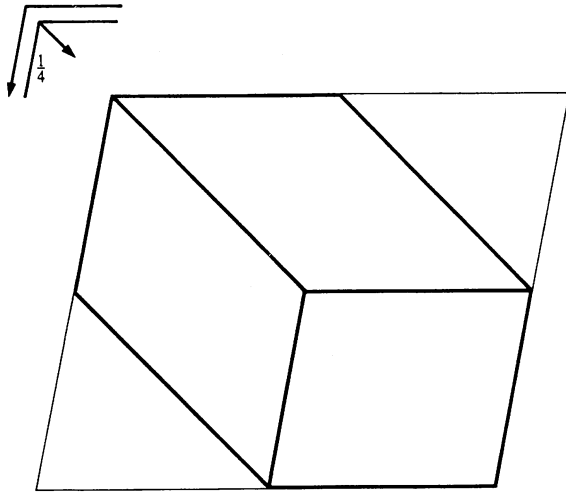
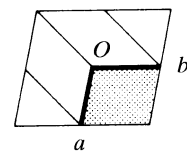
Along $[100]$ $c11m$
 $\mathbf{a}' = \mathbf{b}'_p$ $\mathbf{b}' = \mathbf{c}$
 Origin at $x,0,0$

Along $[010]$ $p1g1$
 $\mathbf{a}' = \frac{1}{2}\mathbf{c}$ $\mathbf{b}' = \mathbf{a}$
 Origin at $0,y,0$

Cc C_s^4 m

Monoclinic

No. 9

UNIQUE AXIS c , DIFFERENT CELL CHOICES $A11a$ UNIQUE AXIS c , CELL CHOICE 1**Origin** on glide plane a **Asymmetric unit** $0 \leq x \leq 1; 0 \leq y \leq 1; 0 \leq z \leq \frac{1}{4}$ **Generators selected** (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(0, \frac{1}{2}, \frac{1}{2})$; (2)**Positions**

| Multiplicity, Wyckoff letter, Site symmetry | Coordinates |
|---|---|
| | $(0,0,0)+ (0, \frac{1}{2}, \frac{1}{2})+$ |

| | | | | |
|---|-----|---|---------------|-----------------------------------|
| 4 | a | 1 | (1) x, y, z | (2) $x + \frac{1}{2}, y, \bar{z}$ |
|---|-----|---|---------------|-----------------------------------|

Reflection conditions

General:

$$hkl: k + l = 2n$$

$$hk0: h, k = 2n$$

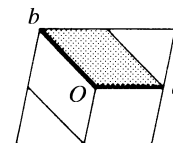
$$0kl: k + l = 2n$$

$$h0l: l = 2n$$

$$00l: l = 2n$$

$$h00: h = 2n$$

$$0k0: k = 2n$$

B11nUNIQUE AXIS c , CELL CHOICE 2**Origin** on glide plane n **Asymmetric unit** $0 \leq x \leq 1; 0 \leq y \leq 1; 0 \leq z \leq \frac{1}{4}$ **Generators selected** (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(\frac{1}{2},0,\frac{1}{2})$; (2)**Positions**Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

 $(0,0,0) + (\frac{1}{2},0,\frac{1}{2}) +$ 4 a 1 (1) x,y,z (2) $x + \frac{1}{2}, y + \frac{1}{2}, \bar{z}$

Reflection conditions

General:

$hkl: h + l = 2n$

$hk0: h, k = 2n$

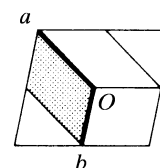
$0kl: l = 2n$

$h0l: h + l = 2n$

$00l: l = 2n$

$h00: h = 2n$

$0k0: k = 2n$

I11bUNIQUE AXIS c , CELL CHOICE 3**Origin** on glide plane b **Asymmetric unit** $0 \leq x \leq 1; 0 \leq y \leq 1; 0 \leq z \leq \frac{1}{4}$ **Generators selected** (1); $t(1,0,0)$; $t(0,1,0)$; $t(0,0,1)$; $t(\frac{1}{2},\frac{1}{2},\frac{1}{2})$; (2)**Positions**Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

 $(0,0,0) + (\frac{1}{2},\frac{1}{2},\frac{1}{2}) +$ 4 a 1 (1) x,y,z (2) $x,y + \frac{1}{2}, \bar{z}$

Reflection conditions

General:

$hkl: h + k + l = 2n$

$hk0: h, k = 2n$

$0kl: k + l = 2n$

$h0l: h + l = 2n$

$00l: l = 2n$

$h00: h = 2n$

$0k0: k = 2n$