

$Cm$

$C_s^3$

$m$

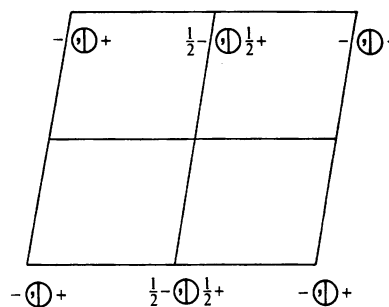
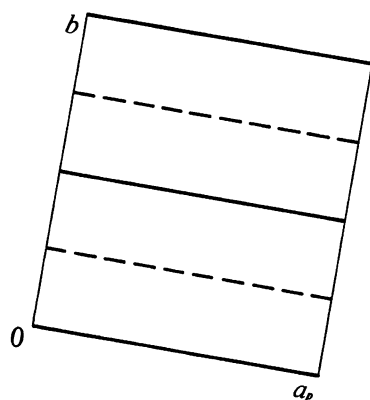
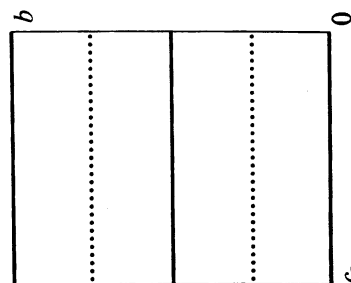
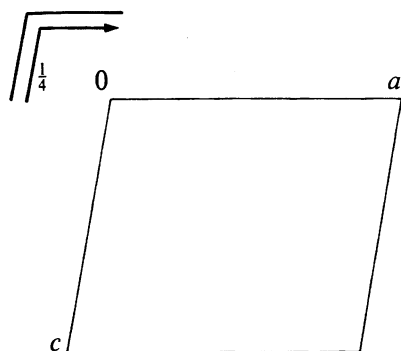
Monoclinic

No. 8

$C1m1$

Patterson symmetry  $C12/m1$

UNIQUE AXIS  $b$ , CELL CHOICE 1



**Origin** on mirror plane  $m$

**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)  $m \ x,0,z$

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

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

**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

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

4 *b* 1 (1)  $x, y, z$  (2)  $x, \bar{y}, z$

Reflection conditions

General:

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

$$h0l: h = 2n$$

$$0kl: k = 2n$$

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

$$0k0: k = 2n$$

$$h00: h = 2n$$

Special: no extra conditions

2 *a* *m*  $x, 0, z$

**Symmetry of special projections**

Along [001] *c* 1 1 *m*

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

Origin at 0, 0, *z*

Along [100] *p* 1 *m* 1

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

Origin at *x*, 0, 0

Along [010] *p* 1

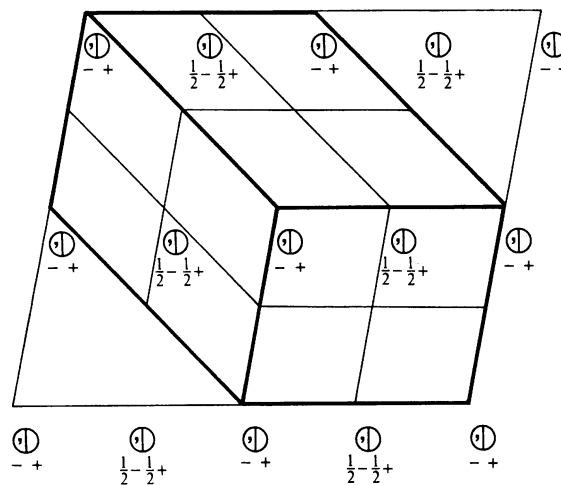
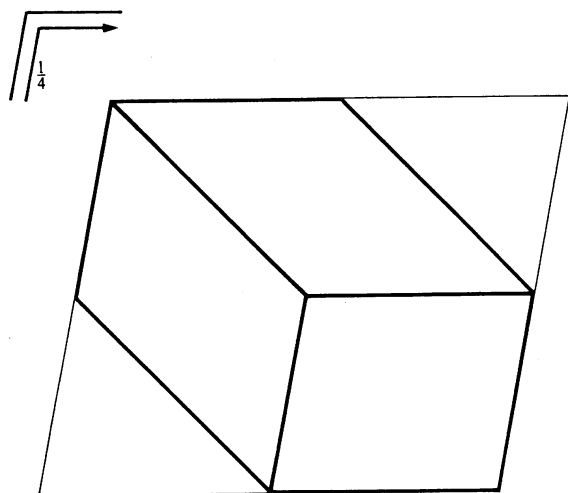
$$\mathbf{a}' = \mathbf{c} \quad \mathbf{b}' = \frac{1}{2}\mathbf{a}$$

Origin at 0, *y*, 0

$Cm$  $C_s^3$  $m$ 

Monoclinic

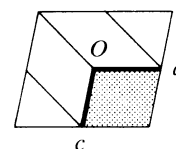
No. 8

UNIQUE AXIS  $b$ , DIFFERENT CELL CHOICES $C1m1$ UNIQUE AXIS  $b$ , CELL CHOICE 1**Origin** on mirror plane  $m$ **Asymmetric unit**  $0 \leq x \leq 1; 0 \leq y \leq \frac{1}{2}; 0 \leq z \leq 1$ **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	$b$	1	(1) $x, y, z$	(2) $x, \bar{y}, z$
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2	$a$	$m$	$x, 0, z$
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Reflection conditions

General:

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

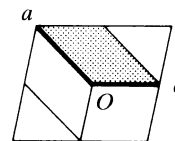
Special: no extra conditions

**A1m1**UNIQUE AXIS *b*, CELL CHOICE 2**Origin** on mirror plane *m***Asymmetric unit**  $0 \leq x \leq 1$ ;  $0 \leq y \leq \frac{1}{2}$ ;  $0 \leq z \leq 1$ **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>b</i>	1	(1) $x, y, z$	(2) $x, \bar{y}, z$
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2	<i>a</i>	<i>m</i>	$x, 0, z$
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Reflection conditions

General:

$hkl: k + l = 2n$

$h0l: l = 2n$

$0kl: k + l = 2n$

$hk0: k = 2n$

$0k0: k = 2n$

$00l: l = 2n$

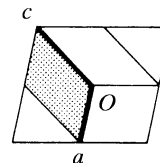
Special: no extra conditions

**I1m1**UNIQUE AXIS *b*, CELL CHOICE 3**Origin** on mirror plane *m***Asymmetric unit**  $0 \leq x \leq 1$ ;  $0 \leq y \leq \frac{1}{2}$ ;  $0 \leq z \leq 1$ **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>b</i>	1	(1) $x, y, z$	(2) $x, \bar{y}, z$
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2	<i>a</i>	<i>m</i>	$x, 0, z$
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Reflection conditions

General:

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

$h0l: h + l = 2n$

$0kl: k + l = 2n$

$hk0: h + k = 2n$

$0k0: k = 2n$

$h00: h = 2n$

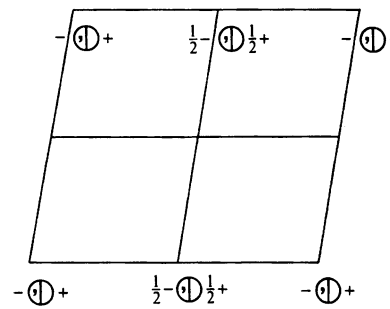
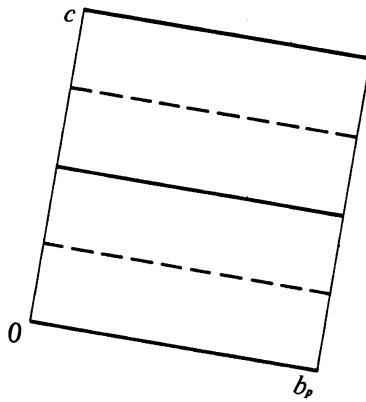
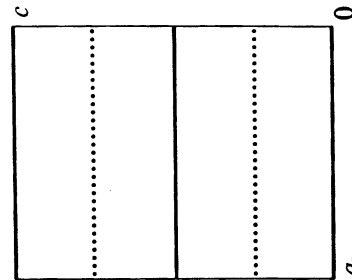
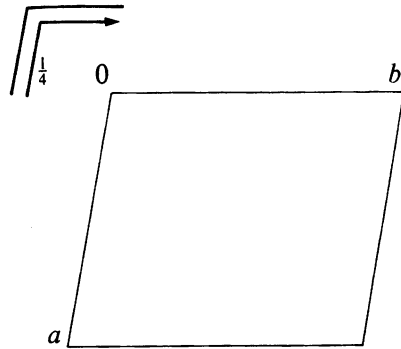
$00l: l = 2n$

Special: no extra conditions

$Cm$  $C_s^3$  $m$ 

Monoclinic

No. 8

 $A11m$ Patterson symmetry  $A112/m$ UNIQUE AXIS  $c$ , CELL CHOICE 1**Origin** on mirror plane  $m$ **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)  $m$   $x,y,0$

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

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

**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

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

4 *b* 1

(1)  $x,y,z$

(2)  $x,y,\bar{z}$

Reflection conditions

General:

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

$hk0$ :  $k=2n$

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

$h0l$ :  $l=2n$

$00l$ :  $l=2n$

$0k0$ :  $k=2n$

Special: no extra conditions

2 *a* *m*  $x,y,0$

**Symmetry of special projections**

Along  $[001]$   $p1$

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

Origin at  $0,0,z$

Along  $[100]$   $c11m$

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

Origin at  $x,0,0$

Along  $[010]$   $p1m1$

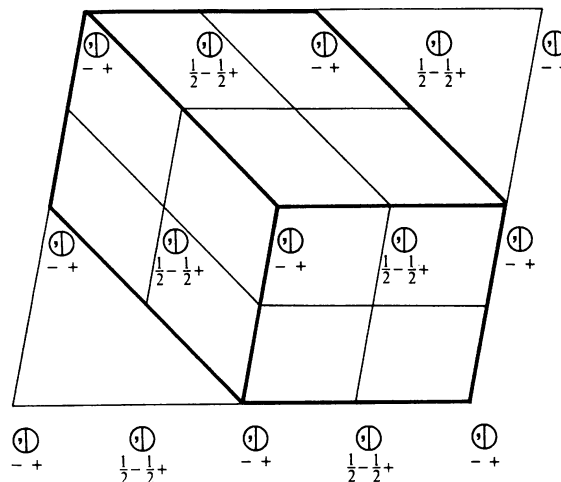
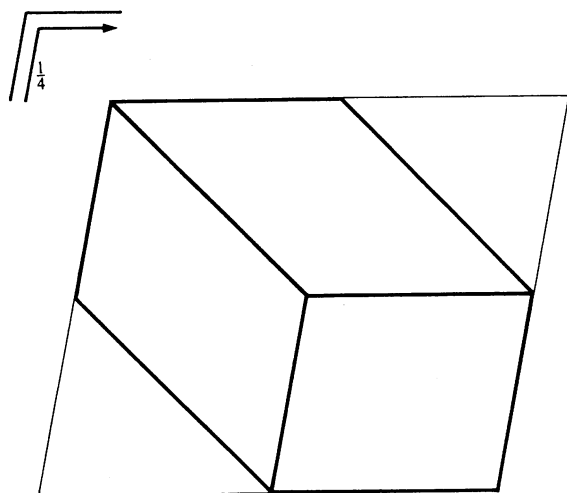
$\mathbf{a}' = \frac{1}{2}\mathbf{c}$   $\mathbf{b}' = \mathbf{a}_p$

Origin at  $0,y,0$

$Cm$  $C_s^3$  $m$ 

Monoclinic

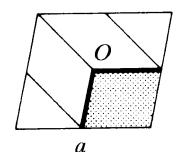
No. 8

UNIQUE AXIS  $c$ , DIFFERENT CELL CHOICES $A11m$ UNIQUE AXIS  $c$ , CELL CHOICE 1**Origin** on mirror plane  $m$ **Asymmetric unit**  $0 \leq x \leq 1; 0 \leq y \leq 1; 0 \leq z \leq \frac{1}{2}$ **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	$b$	1	(1) $x,y,z$	(2) $x,y,\bar{z}$
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2	$a$	$m$	$x,y,0$
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Reflection conditions

General:

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

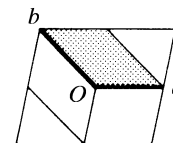
Special: no extra conditions

**B11m**UNIQUE AXIS  $c$ , CELL CHOICE 2**Origin** on mirror plane  $m$ **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	$b$	1	(1) $x,y,z$	(2) $x,y,\bar{z}$
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2	$a$	$m$	$x,y,0$
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Reflection conditions

General:

$hkl: h + l = 2n$

$hk0: h = 2n$

$0kl: l = 2n$

$h0l: h + l = 2n$

$00l: l = 2n$

$h00: h = 2n$

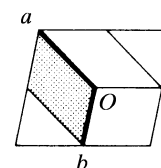
Special: no extra conditions

**I11m**UNIQUE AXIS  $c$ , CELL CHOICE 3**Origin** on mirror plane  $m$ **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	$b$	1	(1) $x,y,z$	(2) $x,y,\bar{z}$
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2	$a$	$m$	$x,y,0$
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Reflection conditions

General:

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

$hk0: h + k = 2n$

$0kl: k + l = 2n$

$h0l: h + l = 2n$

$00l: l = 2n$

$h00: h = 2n$

$0k0: k = 2n$

Special: no extra conditions