

Laue class  $C_{4h} - 4/m$ 

6. SCANNING TABLES

Tetragonal

 No. 86  $P4_2/n$ 
 $\mathcal{G} = P4_2/n$  origin 1

 $C_{4h}^4$ 

Orientation orbit ( <i>hkl</i> )	Conventional basis of the scanning group <b>a'</b> <b>b'</b> <b>d</b>	Scanning group $\mathcal{H}$	Linear orbit <b>sd</b>	Sectional layer group $\mathcal{L}(\mathbf{sd})$	
(001)	<b>a</b> <b>b</b> <b>c</b>	$P4_2/n$ (origin 1)	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p\bar{4}$ $p112/n [(a + b)/4]$ $p112$	L50 L07 L03

 No. 86  $P4_2/n$ 
 $\mathcal{G} = P4_2/n$  origin 2

 $C_{4h}^4$ 

Orientation orbit ( <i>hkl</i> )	Conventional basis of the scanning group <b>a'</b> <b>b'</b> <b>d</b>	Scanning group $\mathcal{H}$	Linear orbit <b>sd</b>	Sectional layer group $\mathcal{L}(\mathbf{sd})$	
(001)	<b>a</b> <b>b</b> <b>c</b>	$P4_2/n$ (origin 2)	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112/n$ $p\bar{4} [(a + b)/4]$ $p112 [(a + b)/4]$	L07 L50 L03

 No. 87  $I4/m$ 
 $\mathcal{G} = I4/m$ 
 $C_{4h}^5$ 

Orientation orbit ( <i>hkl</i> )	Conventional basis of the scanning group <b>a'</b> <b>b'</b> <b>d</b>	Scanning group $\mathcal{H}$	Linear orbit <b>sd</b>	Sectional layer group $\mathcal{L}(\mathbf{sd})$	
(001)	<b>a</b> <b>b</b> <b>c</b>	$I4/m$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p4/m$ $p4/n$ $p112$	L51 L52 L03

 No. 88  $I4_1/a$ 
 $\mathcal{G} = I4_1/a$  origin 1

 $C_{4h}^6$ 

Orientation orbit ( <i>hkl</i> )	Conventional basis of the scanning group <b>a'</b> <b>b'</b> <b>d</b>	Scanning group $\mathcal{H}$	Linear orbit <b>sd</b>	Sectional layer group $\mathcal{L}(\mathbf{sd})$	
(001)	<b>a</b> <b>b</b> <b>c</b>	$I4_1/a$ (origin 1)	$[0\mathbf{d}, \frac{1}{2}\mathbf{d};$ $\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\frac{1}{8}\mathbf{d}, \frac{5}{8}\mathbf{d};$ $\frac{3}{8}\mathbf{d}, \frac{7}{8}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{4})\mathbf{d},$ $(\pm s + \frac{1}{2})\mathbf{d}, (\pm s + \frac{3}{4})\mathbf{d}]$	$p\bar{4}$ $p\bar{4} (a/2 \text{ or } b/2)$ $p112/b (b/4)$ $p112/a (a/4)$ $p112$	L50 L50 L07 L07 L03

No. 88  $I4_1/a$

$\mathcal{G} = I4_1/a$  origin 2

$C_{4h}^6$

Orientation orbit ( <i>hkl</i> )	Conventional basis of the scanning group			Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group	
	$\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$			$\mathcal{L}(s\mathbf{d})$	
(001)	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$	$I4_1/a$ (origin 2)	$[0\mathbf{d}, \frac{1}{2}\mathbf{d};$ $\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\frac{1}{8}\mathbf{d}, \frac{5}{8}\mathbf{d};$ $\frac{3}{8}\mathbf{d}, \frac{7}{8}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{4})\mathbf{d},$ $(\pm s + \frac{1}{2})\mathbf{d}, (\pm s + \frac{3}{4})\mathbf{d}]$	$p112/b$	L07
						$p112/a [(\mathbf{a} + \mathbf{b})/4]$	L07
						$p\bar{4} (\mathbf{b}/4)$	L50
						$p\bar{4} (3\mathbf{b}/4)$	L50
						$p112 (\mathbf{b}/4)$	L03

**Auxiliary tables for Laue class  $C_{4h} - 4/m$**

**Centring types  $P$  and  $I$**

Orientation orbit ( <i>hkl</i> )	Conventional basis of the scanning group			Auxiliary basis of the scanning group		
	$\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	$\hat{\mathbf{a}}$	$\hat{\mathbf{b}}$	$\hat{\mathbf{c}}$
( <i>mn</i> 0)	$\mathbf{c}$	$n\mathbf{a} - m\mathbf{b}$	$p\mathbf{a} + q\mathbf{b}$	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$
( $\bar{m}$ n0)	$\mathbf{c}$	$m\mathbf{a} + n\mathbf{b}$	$-q\mathbf{a} + p\mathbf{b}$			

**Arithmetic classes  $4P$  and  $4I$**

Serial No.	75	76	77	78	79	80
Group type	$C_4^1$	$C_4^2$	$C_4^3$	$C_4^4$	$C_4^5$	$C_4^6$
Group	$P4$	$P4_1$	$P4_2$	$P4_3$	$I4$	$I4_1$
( <i>mn</i> 0)	$P112$	$P112_1$	$P112$	$P112_1$	$I112$	$I112$
( $\bar{m}$ n0)						

**Arithmetic classes  $\bar{4}P$  and  $\bar{4}$**

Serial No.	81	82
Group type	$S_4^1$	$S_4^2$
Group	$P\bar{4}$	$I\bar{4}$
( <i>mn</i> 0)	$P112$	$I112$
( $\bar{m}$ n0)		

**Arithmetic class  $4/mP$**

Serial No.	83	84	85		86	
	Group type $C_{4h}^1$ Group $P4/m$	Group type $C_{4h}^2$ Group $P4_2/m$	Group type $C_{4h}^3$ Group $P4/n$	Group type $C_{4h}^4$ Group $P4_2/n$	Origin 1	Origin 2
( <i>mn</i> 0)	$P112/m$	$P112/m$	$P112/n$	$P112/n$	$P112/n$	$P112/n$
( $\bar{m}$ n0)			$(\mathbf{a} + \mathbf{b})/4$		$(\mathbf{a} + \mathbf{b} + \mathbf{c})/4$	

Arithmetic class  $4/mI$

Serial No.	87	88	
Group type	$C_{4h}^5$	$C_{4h}^6$	
Group	$I4/m$	Origin 1	Origin 2
$(mn0)$	$I112/m$	$I112/b$	$I112/b$
$(\bar{m}n0)$		$(b/4 + c/8)$	

Laue class  $D_{4h} - 4/mmm$

Geometric class  $D_4 - 422$

No. 89  $P422$

$$\mathcal{G} = P422$$

$D_4^1$

Orientation orbit ( $hkl$ )	Conventional basis of the scanning group $\mathbf{a}' \quad \mathbf{b}' \quad \mathbf{d}$	Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
(001)	$\mathbf{a} \quad \mathbf{b} \quad \mathbf{c}$	$P422$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[s\mathbf{d}, -s\mathbf{d}]$	$p422$ $p4$	L53 L49
(100) (010)	$\mathbf{b} \quad \mathbf{c} \quad \mathbf{a}$ $-\mathbf{a} \quad \mathbf{c} \quad \mathbf{b}$	$P222$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[s\mathbf{d}, -s\mathbf{d}]$	$p222$ $p112$	L19 L03
(110) ( $1\bar{1}0$ )	$(-\mathbf{a}+\mathbf{b}) \quad \mathbf{c} \quad (\mathbf{a}+\mathbf{b})$ $(\mathbf{a}+\mathbf{b}) \quad \mathbf{c} \quad (\mathbf{a}-\mathbf{b})$	$B222$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p222$ $p2_122$ $p112$	L19 L20 L03

No. 90  $P42_12$

$$\mathcal{G} = P42_12$$

$D_4^2$

Orientation orbit ( $hkl$ )	Conventional basis of the scanning group $\mathbf{a}' \quad \mathbf{b}' \quad \mathbf{d}$	Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
(001)	$\mathbf{a} \quad \mathbf{b} \quad \mathbf{c}$	$P42_12$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[s\mathbf{d}, -s\mathbf{d}]$	$p42_12 (\mathbf{a}/2 \text{ or } \mathbf{b}/2)$ $p4 (\mathbf{a}/2 \text{ or } \mathbf{b}/2)$	L54 L49
(100) (010)	$\mathbf{b} \quad \mathbf{c} \quad \mathbf{a}$ $-\mathbf{a} \quad \mathbf{c} \quad \mathbf{b}$	$P2_122_1$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p121$ $p2_111$ $p1$	L08 L09 L01
(110) ( $1\bar{1}0$ )	$(-\mathbf{a}+\mathbf{b}) \quad \mathbf{c} \quad (\mathbf{a}+\mathbf{b})$ $(\mathbf{a}+\mathbf{b}) \quad \mathbf{c} \quad (\mathbf{a}-\mathbf{b})$	$B222$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p222$ $p2_122$ $p112$	L19 L20 L03