

Trigonal

6. SCANNING TABLES

Laue class  $D_{3d} - \bar{3}m$ Geometric class  $C_{3v} - 3m$ No. 156  $P3m1$ 

$$\mathcal{G} = P3m1$$

 $C_{3v}^1$ 

Orientation orbit ( <i>hkl</i> )	Conventional basis of the scanning group			Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
	$\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$				
(0001)	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$	$P3m1$	$s\mathbf{d}$	$p3m1$	L69
(01 $\bar{1}$ 0)	$\mathbf{c}$	$\mathbf{a}$	$\mathbf{a} + 2\mathbf{b}$	$A1m1$	$[s\mathbf{d}, (s + \frac{1}{2})\mathbf{d}]$	$p1m1$	L11
( $\bar{1}$ 010)	$\mathbf{c}$	$\mathbf{b}$	$-(2\mathbf{a} + \mathbf{b})$				
(1 $\bar{1}$ 00)	$\mathbf{c}$	$-(\mathbf{a} + \mathbf{b})$	$(\mathbf{a} - \mathbf{b})$				
( $\bar{1}$ 2 $\bar{1}$ 0)	$\mathbf{c}$	$2\mathbf{a} + \mathbf{b}$	$\mathbf{b}$	$A11m$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p11m$	L04
( $\bar{1}$ 120)	$\mathbf{c}$	$(\mathbf{b} - \mathbf{a})$	$-(\mathbf{a} + \mathbf{b})$				
(2 $\bar{1}$ 10)	$\mathbf{c}$	$-(\mathbf{a} + 2\mathbf{b})$	$\mathbf{a}$				

No. 157  $P31m$ 

$$\mathcal{G} = P31m$$

 $C_{3v}^2$ 

Orientation orbit ( <i>hkl</i> )	Conventional basis of the scanning group			Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
	$\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$				
(0001)	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$	$P31m$	$s\mathbf{d}$	$p31m$	L70
(01 $\bar{1}$ 0)	$\mathbf{c}$	$\mathbf{a}$	$\mathbf{a} + 2\mathbf{b}$	$A11m$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p11m$	L04
( $\bar{1}$ 010)	$\mathbf{c}$	$\mathbf{b}$	$-(2\mathbf{a} + \mathbf{b})$				
(1 $\bar{1}$ 00)	$\mathbf{c}$	$-(\mathbf{a} + \mathbf{b})$	$(\mathbf{a} - \mathbf{b})$				
( $\bar{1}$ 2 $\bar{1}$ 0)	$\mathbf{c}$	$2\mathbf{a} + \mathbf{b}$	$\mathbf{b}$	$A1m1$	$[s\mathbf{d}, (s + \frac{1}{2})\mathbf{d}]$	$p1m1$	L11
( $\bar{1}$ 120)	$\mathbf{c}$	$(\mathbf{b} - \mathbf{a})$	$-(\mathbf{a} + \mathbf{b})$				
(2 $\bar{1}$ 10)	$\mathbf{c}$	$-(\mathbf{a} + 2\mathbf{b})$	$\mathbf{a}$				

No. 158  $P3c1$ 

$$\mathcal{G} = P3c1$$

 $C_{3v}^3$ 

Orientation orbit ( <i>hkl</i> )	Conventional basis of the scanning group			Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
	$\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$				
(0001)	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$	$P3c1$	$[s\mathbf{d}, (s + \frac{1}{2})\mathbf{d}]$	$p3$	L65
(01 $\bar{1}$ 0)	$\mathbf{c}$	$\mathbf{a}$	$\mathbf{a} + 2\mathbf{b}$	$A1a1$	$[s\mathbf{d}, (s + \frac{1}{2})\mathbf{d}]$	$p1a1$	L12
( $\bar{1}$ 010)	$\mathbf{c}$	$\mathbf{b}$	$-(2\mathbf{a} + \mathbf{b})$				
(1 $\bar{1}$ 00)	$\mathbf{c}$	$-(\mathbf{a} + \mathbf{b})$	$(\mathbf{a} - \mathbf{b})$				
( $\bar{1}$ 2 $\bar{1}$ 0)	$\mathbf{c}$	$2\mathbf{a} + \mathbf{b}$	$\mathbf{b}$	$A11a$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p11a$	L05
( $\bar{1}$ 120)	$\mathbf{c}$	$(\mathbf{b} - \mathbf{a})$	$-(\mathbf{a} + \mathbf{b})$				
(2 $\bar{1}$ 10)	$\mathbf{c}$	$-(\mathbf{a} + 2\mathbf{b})$	$\mathbf{a}$				

No. 167  $R\bar{3}c$

$$\mathcal{G} = R\bar{3}_c^2$$

$D_{3d}^6$

Orientation orbit		Conventional basis of the scanning group			Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$
HEXAG. AXES $(hkl)$	RHOMB. AXES $(hkl)$	$\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$			
(0001)	(111)	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$	$R\bar{3}c$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}; \frac{1}{3}\mathbf{d}, \frac{5}{6}\mathbf{d}; \frac{2}{3}\mathbf{d}, \frac{1}{6}\mathbf{d}; [\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}; \frac{1}{12}\mathbf{d}, \frac{7}{12}\mathbf{d}; \frac{5}{12}\mathbf{d}, \frac{11}{12}\mathbf{d}]; [\pm s\mathbf{d}, (\pm s + \frac{1}{6})\mathbf{d}, (\pm s + \frac{1}{3})\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}, (\pm s + \frac{2}{3})\mathbf{d}, (\pm s + \frac{5}{6})\mathbf{d}]$	$p\bar{3}$ L66 $p\bar{3} [(2\mathbf{a} + \mathbf{b})/3]$ L66 $p\bar{3} [(\mathbf{a} + 2\mathbf{b})/3]$ L66 $p321$ L68 $p321 [(2\mathbf{a} + \mathbf{b})/3]$ L68 $p321 [(\mathbf{a} + 2\mathbf{b})/3]$ L68 $p3$ L65
(01 $\bar{1}$ 0)	(11 $\bar{1}$ )	$\mathbf{c}$	$\mathbf{a}$	$-\mathbf{c}_r$	$I12_1/a1$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}; [\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]; [\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p12/a1$ L16
( $\bar{1}$ 010)	( $\bar{1}$ 11)	$\mathbf{c}$	$\mathbf{b}$	$-\mathbf{a}_r$			$p12_1/a1 [(\mathbf{a}' + \mathbf{b}')/4]$ L17
(1 $\bar{1}$ 00)	(1 $\bar{1}$ 1)	$\mathbf{c}$	$-(\mathbf{a} + \mathbf{b})$	$-\mathbf{b}_r$			$p1a1$ L12
( $\bar{1}$ 2 $\bar{1}$ 0)	(011)	$\mathbf{c}$	$\mathbf{a}_r$	$\mathbf{b}$	$I112/a$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}; [\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]; [\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112/a$ L07
( $\bar{1}$ 120)	( $\bar{1}$ 01)	$\mathbf{c}$	$\mathbf{b}_r$	$-(\mathbf{a} + \mathbf{b})$			$p112/b$ L07 $[(\mathbf{a}' + \mathbf{b}')/4]$
(2 $\bar{1}$ 10)	(1 $\bar{1}$ 0)	$\mathbf{c}$	$\mathbf{c}_r$	$\mathbf{a}$			$p112 (\mathbf{a}'/4)$ L03

### Auxiliary tables for Laue class $D_{3d} - \bar{3}m$

#### Centring type $P$

Arithmetic classes  $312P$ ,  $31mP$  and  $\bar{3}1mP$

Orientation orbit $(hkl)$	Conventional basis of the scanning group			Auxiliary basis of the scanning group		
	$\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	$\hat{\mathbf{a}}$	$\hat{\mathbf{b}}$	$\hat{\mathbf{c}}$
( $\bar{h}2h\bar{h}l$ )	$2\mathbf{a} + \mathbf{b}$	$n\mathbf{b} - m\mathbf{c}$	$p\mathbf{b} + q\mathbf{c}$	$\mathbf{b}$	$\mathbf{c}$	$2\mathbf{a} + \mathbf{b}$
( $\bar{h}h2hl$ )	$\mathbf{b} - \mathbf{a}$	$-n(\mathbf{a} + \mathbf{b}) - m\mathbf{c}$	$-p(\mathbf{a} + \mathbf{b}) + q\mathbf{c}$	$-(\mathbf{a} + \mathbf{b})$	$\mathbf{c}$	$\mathbf{b} - \mathbf{a}$
( $2h\bar{h}hl$ )	$-(\mathbf{a} + 2\mathbf{b})$	$n\mathbf{a} - m\mathbf{c}$	$p\mathbf{a} + q\mathbf{c}$	$\mathbf{a}$	$\mathbf{c}$	$-\mathbf{a} + 2\mathbf{b}$

$l$  odd  $\Rightarrow n = l, m = 2h; l$  even  $\Rightarrow n = l/2, m = h$

Arithmetic classes  $312P$ ,  $31mP$  and  $\bar{3}1mP$

Serial No.	149	151	153	157	159	162	163
Group type	$D_3^1$	$D_3^3$	$D_3^5$	$C_{3v}^2$	$C_{3v}^4$	$D_{3d}^1$	$D_{3d}^2$
Group	$P312$	$P3_112$	$P3_212$	$P31m$	$P31c$	$\bar{P}31m$	$\bar{P}31c$
( $\bar{h}2h\bar{h}l$ )	$B112$	$B112$	$B112$	$B11m$	$B11b$	$B112/m$	$B112/b$
( $\bar{h}h2hl$ )		$B112 (\mathbf{c}/3)$	$B112 (\mathbf{c}/6)$				
( $2h\bar{h}hl$ )		$B112 (\mathbf{c}/6)$	$B112 (\mathbf{c}/3)$				