Trigonal   6. SCANNING TABLES   Laue class $D_{3d} - \overline{3}m$

Geometric class $D_{3d} - \overline{3}m$

No. 162 $P\overline{3}1m$ D_{3d}^1

$$\mathcal{G} = P\overline{3}1\tfrac{2}{m}$$

Orientation orbit ($hkil$)	Conventional basis of the scanning group a'	b'	d	Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
(0001)	**a**	**b**	**c**	$P\overline{3}1m$	$0\mathbf{d}, \tfrac{1}{2}\mathbf{d}$	$p\overline{3}1m$	L71
					$[s\mathbf{d}, -s\mathbf{d}]$	$p31m$	L70
$(01\overline{1}0)$	**c**	**a**	$\mathbf{a} + 2\mathbf{b}$	$A112/m$	$[0\mathbf{d}, \tfrac{1}{2}\mathbf{d}]$	$p112/m$	L06
$(\overline{1}010)$	**c**	**b**	$-(2\mathbf{a}+\mathbf{b})$		$[\tfrac{1}{4}\mathbf{d}, \tfrac{3}{4}\mathbf{d}]$	$p112/b\ (\mathbf{b}'/4)$	L07
$(1\overline{1}00)$	**c**	$-(\mathbf{a}+\mathbf{b})$	$(\mathbf{a}-\mathbf{b})$		$[\pm s\mathbf{d}, (\pm s + \tfrac{1}{2})\mathbf{d}]$	$p112$	L03
$(\overline{1}2\overline{1}0)$	**c**	$2\mathbf{a}+\mathbf{b}$	**b**	$A12/m1$	$[0\mathbf{d}, \tfrac{1}{2}\mathbf{d}]$	$p12/m1$	L14
$(\overline{1}\overline{1}20)$	**c**	$(\mathbf{b}-\mathbf{a})$	$-(\mathbf{a}+\mathbf{b})$		$[\tfrac{1}{4}\mathbf{d}, \tfrac{3}{4}\mathbf{d}]$	$p12_1/m1\ (\mathbf{b}'/4)$	L15
$(2\overline{1}\overline{1}0)$	**c**	$-(\mathbf{a}+2\mathbf{b})$	**a**		$[\pm s\mathbf{d}, (\pm s + \tfrac{1}{2})\mathbf{d}]$	$p1m1$	L11

No. 163 $P\overline{3}1c$ D_{3d}^2

$$\mathcal{G} = P\overline{3}1\tfrac{2}{c}$$

Orientation orbit ($hkil$)	Conventional basis of the scanning group a'	b'	d	Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
(0001)	**a**	**b**	**c**	$P\overline{3}1c$	$[0\mathbf{d}, \tfrac{1}{2}\mathbf{d}]$	$p\overline{3}$	L66
					$[\tfrac{1}{4}\mathbf{d}, \tfrac{3}{4}\mathbf{d}]$	$p312$	L67
					$[\pm s\mathbf{d}, (\pm s + \tfrac{1}{2})\mathbf{d}]$	$p3$	L65
$(01\overline{1}0)$	**c**	**a**	$\mathbf{a} + 2\mathbf{b}$	$A112/a$	$[0\mathbf{d}, \tfrac{1}{2}\mathbf{d}]$	$p112/a$	L07
$(\overline{1}010)$	**c**	**b**	$-(2\mathbf{a}+\mathbf{b})$		$[\tfrac{1}{4}\mathbf{d}, \tfrac{3}{4}\mathbf{d}]$	$p112/n\ (\mathbf{b}'/4)$	L07
$(1\overline{1}00)$	**c**	$-(\mathbf{a}+\mathbf{b})$	$(\mathbf{a}-\mathbf{b})$		$[\pm s\mathbf{d}, (\pm s + \tfrac{1}{2})\mathbf{d}]$	$p112\ (\mathbf{a}'/4)$	L03
$(\overline{1}2\overline{1}0)$	**c**	$2\mathbf{a}+\mathbf{b}$	**b**	$A12/a1$	$[0\mathbf{d}, \tfrac{1}{2}\mathbf{d}]$	$p12/a1$	L16
$(\overline{1}\overline{1}20)$	**c**	$(\mathbf{b}-\mathbf{a})$	$-(\mathbf{a}+\mathbf{b})$		$[\tfrac{1}{4}\mathbf{d}, \tfrac{3}{4}\mathbf{d}]$	$p12_1/a1\ (\mathbf{b}'/4)$	L17
$(2\overline{1}\overline{1}0)$	**c**	$-(\mathbf{a}+2\mathbf{b})$	**a**		$[\pm s\mathbf{d}, (\pm s + \tfrac{1}{2})\mathbf{d}]$	$p1a1$	L12

No. 164 $P\overline{3}m1$ D_{3d}^3

$$\mathcal{G} = P\overline{3}\tfrac{2}{m}1$$

Orientation orbit ($hkil$)	Conventional basis of the scanning group a'	b'	d	Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
(0001)	**a**	**b**	**c**	$P\overline{3}m1$	$0\mathbf{d}, \tfrac{1}{2}\mathbf{d}$	$p\overline{3}m1$	L72
					$[s\mathbf{d}, -s\mathbf{d}]$	$p3m1$	L69
$(01\overline{1}0)$	**c**	**a**	$\mathbf{a} + 2\mathbf{b}$	$A12/m1$	$[0\mathbf{d}, \tfrac{1}{2}\mathbf{d}]$	$p12/m1$	L14
$(\overline{1}010)$	**c**	**b**	$-(2\mathbf{a}+\mathbf{b})$		$[\tfrac{1}{4}\mathbf{d}, \tfrac{3}{4}\mathbf{d}]$	$p12_1/m1\ (\mathbf{b}'/4)$	L15
$(1\overline{1}00)$	**c**	$-(\mathbf{a}+\mathbf{b})$	$(\mathbf{a}-\mathbf{b})$		$[\pm s\mathbf{d}, (\pm s + \tfrac{1}{2})\mathbf{d}]$	$p1m1$	L11
$(\overline{1}2\overline{1}0)$	**c**	$2\mathbf{a}+\mathbf{b}$	**b**	$A112/m$	$[0\mathbf{d}, \tfrac{1}{2}\mathbf{d}]$	$p112/m$	L06
$(\overline{1}\overline{1}20)$	**c**	$(\mathbf{b}-\mathbf{a})$	$-(\mathbf{a}+\mathbf{b})$		$[\tfrac{1}{4}\mathbf{d}, \tfrac{3}{4}\mathbf{d}]$	$p112/b\ (\mathbf{b}'/4)$	L07
$(2\overline{1}\overline{1}0)$	**c**	$-(\mathbf{a}+2\mathbf{b})$	**a**		$[\pm s\mathbf{d}, (\pm s + \tfrac{1}{2})\mathbf{d}]$	$p112$	L03

No. 167 $R\overline{3}c$ D_{3d}^{6}

$$\mathcal{G} = R\overline{3}\tfrac{2}{c}$$

Orientation orbit		Conventional basis of the scanning group			Scanning group	Linear orbit	Sectional layer group	
HEXAG. AXES $(hkil)$	RHOMB. AXES (hkl)	$\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	$\mathcal{H}$	$s\mathbf{d}$	$\mathcal{L}(s\mathbf{d})$	
(0001)	(111)	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$	$R\overline{3}c$	$[0\mathbf{d}, \tfrac{1}{2}\mathbf{d};$	$p\overline{3}$	L66
						$\tfrac{1}{3}\mathbf{d}, \tfrac{5}{6}\mathbf{d};$	$p\overline{3}\,[(2\mathbf{a}+\mathbf{b})/3]$	L66
						$\tfrac{2}{3}\mathbf{d}, \tfrac{1}{6}\mathbf{d}]$	$p\overline{3}\,[(\mathbf{a}+2\mathbf{b})/3]$	L66
						$[\tfrac{1}{4}\mathbf{d}, \tfrac{3}{4}\mathbf{d};$	$p321$	L68
						$\tfrac{1}{12}\mathbf{d}, \tfrac{7}{12}\mathbf{d};$	$p321\,[(2\mathbf{a}+\mathbf{b})/3]$	L68
						$\tfrac{5}{12}\mathbf{d}, \tfrac{11}{12}\mathbf{d}]$	$p321\,[(\mathbf{a}+2\mathbf{b})/3]$	L68
						$[\pm s\mathbf{d}, (\pm s + \tfrac{1}{6})\mathbf{d},$		
						$(\pm s + \tfrac{1}{3})\mathbf{d}, (\pm s + \tfrac{1}{2})\mathbf{d},$		
						$(\pm s + \tfrac{2}{3})\mathbf{d}, (\pm s + \tfrac{5}{6})\mathbf{d}]$	$p3$	L65
$(01\overline{1}0)$	$(11\overline{1})$	$\mathbf{c}$	$\mathbf{a}$	$-\mathbf{c}_r$	$I12_1/a1$	$[0\mathbf{d}, \tfrac{1}{2}\mathbf{d}]$	$p12/a1$	L16
$(\overline{1}010)$	$(\overline{1}11)$	$\mathbf{c}$	$\mathbf{b}$	$-\mathbf{a}_r$		$[\tfrac{1}{4}\mathbf{d}, \tfrac{3}{4}\mathbf{d}]$	$p12_1/a1 \;\; [(\mathbf{a}' + \mathbf{b}')/4]$	L17
$(1\overline{1}00)$	$(1\overline{1}1)$	$\mathbf{c}$	$-(\mathbf{a}+\mathbf{b})$	$-\mathbf{b}_r$		$[\pm s\mathbf{d}, (\pm s + \tfrac{1}{2})\mathbf{d}]$	$p1a1$	L12
$(\overline{1}2\overline{1}0)$	$(01\overline{1})$	$\mathbf{c}$	$\mathbf{a}_r$	$\mathbf{b}$	$I112/a$	$[0\mathbf{d}, \tfrac{1}{2}\mathbf{d}]$	$p112/a$	L07
$(\overline{1}\overline{1}20)$	$(\overline{1}01)$	$\mathbf{c}$	$\mathbf{b}_r$	$-(\mathbf{a}+\mathbf{b})$		$[\tfrac{1}{4}\mathbf{d}, \tfrac{3}{4}\mathbf{d}]$	$p112/b \; [(\mathbf{a}' + \mathbf{b}')/4]$	L07
$(2\overline{1}\overline{1}0)$	$(1\overline{1}0)$	$\mathbf{c}$	$\mathbf{c}_r$	$\mathbf{a}$		$[\pm s\mathbf{d}, (\pm s + \tfrac{1}{2})\mathbf{d}]$	$p112\,(\mathbf{a}'/4)$	L03

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

Centring type P

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

Orientation orbit $(hkil)$	Conventional basis of the scanning group			Auxiliary basis of the scanning group		
	$\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	$\widehat{\mathbf{a}}$	$\widehat{\mathbf{b}}$	$\widehat{\mathbf{c}}$
$(\overline{h}2h\overline{h}l)$	$2\mathbf{a}+\mathbf{b}$	$n\mathbf{b}-m\mathbf{c}$	$p\mathbf{b}+q\mathbf{c}$	$\mathbf{b}$	$\mathbf{c}$	$2\mathbf{a}+\mathbf{b}$
$(\overline{hh}2hl)$	$\mathbf{b}-\mathbf{a}$	$-n(\mathbf{a}+\mathbf{b})-m\mathbf{c}$	$-p(\mathbf{a}+\mathbf{b})+q\mathbf{c}$	$-(\mathbf{a}+\mathbf{b})$	$\mathbf{c}$	$\mathbf{b}-\mathbf{a}$
$(2h\overline{hh}l)$	$-(\mathbf{a}+2\mathbf{b})$	$n\mathbf{a}-m\mathbf{c}$	$p\mathbf{a}+q\mathbf{c}$	$\mathbf{a}$	$\mathbf{c}$	$-\mathbf{a}+2\mathbf{b}$
l odd $\Rightarrow n = l, m = 2h$; l even $\Rightarrow n = l/2, m = h$						

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

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