

Hexagonal

6. SCANNING TABLES

 Laue class $D_{6h} - 6/mmm$

 No. 192 $P6/mcc$
 D_{6h}^2

$$\mathcal{G} = P6_{mcc}^{\underline{6} \underline{2} \underline{2}}$$

Orientation orbit (<i>hkil</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}	$P6/mcc$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p6/m$ L75 $p622$ L76 $p6$ L73
(01 $\bar{1}$ 0)	\mathbf{c}	\mathbf{a}	$\mathbf{a} + 2\mathbf{b}$	$Amaa$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$pmaa$ L38
($\bar{1}$ 010)	\mathbf{c}	\mathbf{b}	$-(2\mathbf{a} + \mathbf{b})$			$pman (\mathbf{b}'/4)$ L42
(1 $\bar{1}$ 00)	\mathbf{c}	$-(\mathbf{a} + \mathbf{b})$	$(\mathbf{a} - \mathbf{b})$			$pma2 (\mathbf{a}'/4)$ L24
($\bar{1}$ 2 $\bar{1}$ 0)	\mathbf{c}	$2\mathbf{a} + \mathbf{b}$	\mathbf{b}	$Amaa$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$pmaa$ L38
($\bar{1}$ 120)	\mathbf{c}	$(\mathbf{b} - \mathbf{a})$	$-(\mathbf{a} + \mathbf{b})$			$pman (\mathbf{b}'/4)$ L42
(2 $\bar{1}$ 10)	\mathbf{c}	$-(\mathbf{a} + 2\mathbf{b})$	\mathbf{a}			$pma2 (\mathbf{a}'/4)$ L24

 No. 193 $P6_3/mcm$
 D_{6h}^3

$$\mathcal{G} = P6_{3mcm}^{\underline{6}_3 \underline{2} \underline{2}}$$

Orientation orbit (<i>hkil</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}	$P6_3/mcm$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p\bar{3}1m$ L71 $p\bar{6}2m$ L79 $p31m$ L70
(01 $\bar{1}$ 0)	\mathbf{c}	\mathbf{a}	$\mathbf{a} + 2\mathbf{b}$	$Amam$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$pmam$ L40
($\bar{1}$ 010)	\mathbf{c}	\mathbf{b}	$-(2\mathbf{a} + \mathbf{b})$			$pmab (\mathbf{b}'/4)$ L45
(1 $\bar{1}$ 00)	\mathbf{c}	$-(\mathbf{a} + \mathbf{b})$	$(\mathbf{a} - \mathbf{b})$			$pma2$ L24
($\bar{1}$ 2 $\bar{1}$ 0)	\mathbf{c}	$2\mathbf{a} + \mathbf{b}$	\mathbf{b}	$Amma$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$pmma$ L41
($\bar{1}$ 120)	\mathbf{c}	$(\mathbf{b} - \mathbf{a})$	$-(\mathbf{a} + \mathbf{b})$			$pmmn (\mathbf{b}'/4)$ L46
(2 $\bar{1}$ 10)	\mathbf{c}	$-(\mathbf{a} + 2\mathbf{b})$	\mathbf{a}			$pmm2 (\mathbf{a}'/4)$ L23

 No. 194 $P6_3/mmc$
 D_{6h}^4

$$\mathcal{G} = P6_{3mmc}^{\underline{6}_3 \underline{2} \underline{2}}$$

Orientation orbit (<i>hkil</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}	$P6_3/mmc$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p\bar{3}m1$ L72 $p\bar{6}m2$ L78 $p3m1$ L69
(01 $\bar{1}$ 0)	\mathbf{c}	\mathbf{a}	$\mathbf{a} + 2\mathbf{b}$	$Amma$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$pmma$ L41
($\bar{1}$ 010)	\mathbf{c}	\mathbf{b}	$-(2\mathbf{a} + \mathbf{b})$			$pmmn (\mathbf{b}'/4)$ L46
(1 $\bar{1}$ 00)	\mathbf{c}	$-(\mathbf{a} + \mathbf{b})$	$(\mathbf{a} - \mathbf{b})$			$pmm2 (\mathbf{a}'/4)$ L23
($\bar{1}$ 2 $\bar{1}$ 0)	\mathbf{c}	$2\mathbf{a} + \mathbf{b}$	\mathbf{b}	$Amam$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$pmam$ L40
($\bar{1}$ 120)	\mathbf{c}	$(\mathbf{b} - \mathbf{a})$	$-(\mathbf{a} + \mathbf{b})$			$pmab (\mathbf{b}'/4)$ L45
(2 $\bar{1}$ 10)	\mathbf{c}	$-(\mathbf{a} + 2\mathbf{b})$	\mathbf{a}			$pma2$ L24

Auxiliary tables for Laue class $D_{6h} - 6/mmm$

Centring type P

Orientation orbit ($hkil$)	Conventional basis of the scanning group			Auxiliary basis of the scanning group		
	\mathbf{a}'	\mathbf{b}'	\mathbf{d}	$\hat{\mathbf{a}}$	$\hat{\mathbf{b}}$	$\hat{\mathbf{c}}$
$(\overline{mnm} + n0)$	\mathbf{c}	$n\mathbf{a} - m\mathbf{b}$	$p\mathbf{a} + q\mathbf{b}$	\mathbf{a}	\mathbf{b}	\mathbf{c}
$(\overline{m} + \overline{nmn}0)$	\mathbf{c}	$m\mathbf{a} + (m+n)\mathbf{b}$	$-q\mathbf{a} + (p-q)\mathbf{b}$	\mathbf{b}	$-(\mathbf{a} + \mathbf{b})$	\mathbf{c}
$(\overline{nm} + \overline{nm}0)$	\mathbf{c}	$-(m+n)\mathbf{a} - n\mathbf{b}$	$(q-p)\mathbf{a} - p\mathbf{b}$	$-(\mathbf{a} + \mathbf{b})$	\mathbf{a}	\mathbf{c}
$(\overline{nmn} + n0)$	$-\mathbf{c}$	$m\mathbf{a} - n\mathbf{b}$	$-q\mathbf{a} - p\mathbf{b}$	$-\mathbf{b}$	$-\mathbf{a}$	$-\mathbf{c}$
$(\overline{m} + \overline{nm}0)$	\mathbf{c}	$n\mathbf{a} + (m+n)\mathbf{b}$	$p\mathbf{a} + (p-q)\mathbf{b}$	$\mathbf{a} + \mathbf{b}$	$-\mathbf{b}$	$-\mathbf{c}$
$(\overline{mm} + \overline{nn}0)$	$-\mathbf{c}$	$-(m+n)\mathbf{a} - m\mathbf{b}$	$(q-p)\mathbf{a} + q\mathbf{b}$	$-\mathbf{a}$	$\mathbf{a} + \mathbf{b}$	$-\mathbf{c}$
$(0h\overline{hl})$	\mathbf{a}	$n(\mathbf{a} + 2\mathbf{b}) - m\mathbf{c}$	$p(\mathbf{a} + 2\mathbf{b}) + q\mathbf{c}$	$\mathbf{a} + 2\mathbf{b}$	\mathbf{c}	\mathbf{a}
$(0h\overline{h}\overline{l})$	$-\mathbf{a}$	$n(\mathbf{a} + 2\mathbf{b}) + m\mathbf{c}$	$p(\mathbf{a} + 2\mathbf{b}) - q\mathbf{c}$			
$(\overline{h}0hl)$	\mathbf{b}	$-n(2\mathbf{a} + \mathbf{b}) - m\mathbf{c}$	$-p(2\mathbf{a} + \mathbf{b}) + q\mathbf{c}$	$-(2\mathbf{a} + \mathbf{b})$	\mathbf{c}	\mathbf{b}
$(\overline{h}0h\overline{l})$	$-\mathbf{b}$	$-n(2\mathbf{a} + \mathbf{b}) + m\mathbf{c}$	$-p(2\mathbf{a} + \mathbf{b}) - q\mathbf{c}$			
$(h\overline{h}0l)$	$-(\mathbf{a} + \mathbf{b})$	$n(\mathbf{a} - \mathbf{b}) - m\mathbf{c}$	$p(\mathbf{a} - \mathbf{b}) + q\mathbf{c}$	$\mathbf{a} - \mathbf{b}$	\mathbf{c}	$-(\mathbf{a} + \mathbf{b})$
$(h\overline{h}0\overline{l})$	$(\mathbf{a} + \mathbf{b})$	$n(\mathbf{a} - \mathbf{b}) + m\mathbf{c}$	$p(\mathbf{a} - \mathbf{b}) - q\mathbf{c}$			
$l \text{ odd} \Rightarrow n = l, m = 2h; l \text{ even} \Rightarrow n = l/2, m = h$						
$(\overline{h}2h\overline{hl})$	$2\mathbf{a} + \mathbf{b}$	$n\mathbf{b} - m\mathbf{c}$	$p\mathbf{b} + q\mathbf{c}$	\mathbf{b}	\mathbf{c}	$2\mathbf{a} + \mathbf{b}$
$(\overline{h}2h\overline{h}\overline{l})$	$-(2\mathbf{a} + \mathbf{b})$	$n\mathbf{b} + m\mathbf{c}$	$p\mathbf{b} - q\mathbf{c}$			
$(\overline{hh}2hl)$	$\mathbf{b} - \mathbf{a}$	$-n(\mathbf{a} + \mathbf{b}) - m\mathbf{c}$	$-p(\mathbf{a} + \mathbf{b}) + q\mathbf{c}$	$-(\mathbf{a} + \mathbf{b})$	\mathbf{c}	$\mathbf{b} - \mathbf{a}$
$(\overline{hh}2h\overline{l})$	$\mathbf{a} - \mathbf{b}$	$-n(\mathbf{a} + \mathbf{b}) + m\mathbf{c}$	$-p(\mathbf{a} + \mathbf{b}) - q\mathbf{c}$			
$(2h\overline{hhl})$	$-(\mathbf{a} + 2\mathbf{b})$	$n\mathbf{a} - m\mathbf{c}$	$p\mathbf{a} + q\mathbf{c}$	\mathbf{a}	\mathbf{c}	$-\mathbf{a} + 2\mathbf{b}$
$(2h\overline{h}\overline{hl})$	$\mathbf{a} + 2\mathbf{b}$	$n\mathbf{a} + m\mathbf{c}$	$p\mathbf{a} - q\mathbf{c}$			
$l \text{ odd} \Rightarrow n = l, m = 2h; l \text{ even} \Rightarrow n = l/2, m = h$						

Arithmetic class 622P

Serial No.	177	178	179	180	181	182
Group type	D_6^1	D_6^2	D_6^3	D_6^4	D_6^5	D_6^6
Group	$P6_{22}$	$P6_{122}$	$P6_{522}$	$P6_{22}$	$P6_{422}$	$P6_{322}$
$(\overline{mnm} + n0)$	$P112$	$P112_1$	$P112_1$	$P112$	$P112$	$P112_1$
$(\overline{m} + \overline{nmn}0)$						
$(\overline{nm} + \overline{nm}0)$						
$(\overline{nmn} + n0)$						
$(\overline{m} + \overline{nm}0)$						
$(\overline{mm} + \overline{nn}0)$						
Reference group $B112$ with respect to origin at:						
$(0h\overline{hl})$	P	P	P	P	P	P
$(0h\overline{h}\overline{l})$						
$(\overline{h}0hl)$		$P + \mathbf{c}/3$	$P + \mathbf{c}/6$	$P + \mathbf{c}/6$	$P + \mathbf{c}/3$	
$(\overline{h}0h\overline{l})$						
$(h\overline{h}0l)$		$P + \mathbf{c}/6$	$P + \mathbf{c}/3$	$P + \mathbf{c}/3$	$P + \mathbf{c}/6$	
$(h\overline{h}0\overline{l})$						
$(\overline{h}2h\overline{hl})$	P	$P + \mathbf{c}/12$	$P + 5\mathbf{c}/12$	$P + \mathbf{c}/6$	$P + \mathbf{c}/3$	$P + \mathbf{c}/4$
$(\overline{h}2h\overline{h}\overline{l})$						
$(\overline{hh}2hl)$		$P + 5\mathbf{c}/12$	$P + \mathbf{c}/12$	$P + \mathbf{c}/3$	$P + \mathbf{c}/6$	
$(\overline{hh}2h\overline{l})$						
$(2h\overline{hhl})$		$P + \mathbf{c}/4$	$P + \mathbf{c}/4$	P	P	
$(2h\overline{h}\overline{hl})$						

Arithmetic class $6/mmmP$

Serial No. Group type Group	191 D_{6h}^1 $P6/mmm$	192 D_{6h}^2 $P6/mcc$	193 D_{6h}^3 $P6_3/mcm$	194 D_{6h}^4 $P6_3/mmc$
$(\overline{mnm} + \overline{n0})$ $(\overline{m} + \overline{nmn0})$ $(\overline{nm} + \overline{nm0})$ $(\overline{nm\overline{m}} + \overline{n0})$ $(\overline{m} + \overline{nm0})$ $(\overline{mm} + \overline{nn0})$	$P112/m$	$P112/m$	$P112_1/m$	$P112_1/m$
$(0h\overline{hl})$ $(0h\overline{hl})$ $(\overline{h}0hl)$ $(\overline{h}0h\overline{l})$ $(h\overline{h}0l)$ $(h\overline{h}0\overline{l})$	$B112/m$	$B112/b$	$B112/b$	$B112/m$
$(\overline{h}2h\overline{hl})$ $(\overline{h}2h\overline{hl})$ $(\overline{h}h2hl)$ $(\overline{h}h2h\overline{l})$ $(2h\overline{hhl})$ $(2h\overline{hhl})$	$B112/m$	$B112/b$	$B112/m$	$B112/b$