Laue class $D_{6h} - 6/mmm$ 6. SCANNING TABLES Hexagonal

No. 180 $P6_222$ D_6^4

$$\mathcal{G} = P6_222$$

Orientation orbit $(hkil)$	Conventional basis of the scanning group $\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
(0001)	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$	$P6_222$	$[0\mathbf{d},\ \ [\frac{1}{2}\mathbf{d},$	$\widehat{c_1}222$	L10
					$\frac{1}{3}\mathbf{d},\ \|\ \frac{5}{6}\mathbf{d},$	$\widehat{c_3}222$	L10
					$\frac{2}{3}\mathbf{d}]\quad \frac{1}{6}\mathbf{d}]$	$\widehat{c_2}222$	L10
					$[\pm s\mathbf{d}, (\pm s + \frac{1}{3})\mathbf{d}, (\pm s + \frac{2}{3})\mathbf{d}]$	$p112$	L03
$(01\bar{1}0)$	$\mathbf{c}$	$\mathbf{a}$	$\mathbf{a} + 2\mathbf{b}$	$A222$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p222$	L19
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p22_12$	L20
					$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112$	L03
$(\bar{1}010)$	$\mathbf{c}$	$\mathbf{b}$	$-(2\mathbf{a}+\mathbf{b})$	$A222\ (\mathbf{a}'/6)$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p222\ (\mathbf{a}'/6)$	L19
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p22_12\ (\mathbf{a}'/6)$	L20
					$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112\ (\mathbf{a}'/6)$	L03
$(1\bar{1}00)$	$\mathbf{c}$	$-(\mathbf{a} + \mathbf{b})$	$(\mathbf{a} - \mathbf{b})$	$A222\ (\mathbf{a}'/3)$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p222\ (\mathbf{a}'/3)$	L19
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p22_12\ (\mathbf{a}'/3)$	L20
					$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112\ (\mathbf{a}'/3)$	L03
$(\bar{1}2\bar{1}0)$	$\mathbf{c}$	$2\mathbf{a} + \mathbf{b}$	$\mathbf{b}$	$A222\ (\mathbf{a}'/6)$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p222\ (\mathbf{a}'/6)$	L19
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p22_12\ (\mathbf{a}'/6)$	L20
					$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112\ (\mathbf{a}'/6)$	L03
$(\bar{1}\bar{1}20)$	$\mathbf{c}$	$(\mathbf{b} - \mathbf{a})$	$-(\mathbf{a} + \mathbf{b})$	$A222\ (\mathbf{a}'/3)$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p222\ (\mathbf{a}'/3)$	L19
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p22_12\ (\mathbf{a}'/3)$	L20
					$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112\ (\mathbf{a}'/3)$	L03
$(2\bar{1}\bar{1}0)$	$\mathbf{c}$	$-(\mathbf{a}+2\mathbf{b})$	$\mathbf{a}$	$A222$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p222$	L19
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p22_12$	L20
					$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112$	L03

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		
	$\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	$\widehat{\mathbf{a}}$	$\widehat{\mathbf{b}}$	$\widehat{\mathbf{c}}$
$(mn\overline{m+n}0)$	$\mathbf{c}$	$n\mathbf{a} - m\mathbf{b}$	$p\mathbf{a} + q\mathbf{b}$	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$
$(\overline{m+n}mn0)$	$\mathbf{c}$	$m\mathbf{a} + (m+n)\mathbf{b}$	$-q\mathbf{a} + (p-q)\mathbf{b}$	$\mathbf{b}$	$-(\mathbf{a}+\mathbf{b})$	$\mathbf{c}$
$(n\overline{m+n}m0)$	$\mathbf{c}$	$-(m+n)\mathbf{a} - n\mathbf{b}$	$(q-p)\mathbf{a} - p\mathbf{b}$	$-(\mathbf{a}+\mathbf{b})$	$\mathbf{a}$	$\mathbf{c}$
$(nm\overline{m+n}0)$	$-\mathbf{c}$	$m\mathbf{a} - n\mathbf{b}$	$-q\mathbf{a} - p\mathbf{b}$	$-\mathbf{b}$	$-\mathbf{a}$	$-\mathbf{c}$
$(\overline{m+n}nm0)$	$\mathbf{c}$	$n\mathbf{a} + (m+n)\mathbf{b}$	$p\mathbf{a} + (p-q)\mathbf{b}$	$\mathbf{a}+\mathbf{b}$	$-\mathbf{b}$	$-\mathbf{c}$
$(m\overline{m+n}n0)$	$-\mathbf{c}$	$-(m+n)\mathbf{a} - m\mathbf{b}$	$(q-p)\mathbf{a} + q\mathbf{b}$	$-\mathbf{a}$	$\mathbf{a}+\mathbf{b}$	$-\mathbf{c}$
$(0h\overline{h}l)$	$\mathbf{a}$	$n(\mathbf{a}+2\mathbf{b}) - m\mathbf{c}$	$p(\mathbf{a}+2\mathbf{b}) + q\mathbf{c}$	$\mathbf{a}+2\mathbf{b}$	$\mathbf{c}$	$\mathbf{a}$
$(0h\overline{h}\overline{l})$	$-\mathbf{a}$	$n(\mathbf{a}+2\mathbf{b}) + m\mathbf{c}$	$p(\mathbf{a}+2\mathbf{b}) - q\mathbf{c}$			
$(\overline{h}0hl)$	$\mathbf{b}$	$-n(2\mathbf{a}+\mathbf{b}) - m\mathbf{c}$	$-p(2\mathbf{a}+\mathbf{b}) + q\mathbf{c}$	$-(2\mathbf{a}+\mathbf{b})$	$\mathbf{c}$	$\mathbf{b}$
$(\overline{h}0h\overline{l})$	$-\mathbf{b}$	$-n(2\mathbf{a}+\mathbf{b}) + m\mathbf{c}$	$-p(2\mathbf{a}+\mathbf{b}) - q\mathbf{c}$			
$(h\overline{h}0l)$	$-(\mathbf{a}+\mathbf{b})$	$n(\mathbf{a}-\mathbf{b}) - m\mathbf{c}$	$p(\mathbf{a}-\mathbf{b}) + q\mathbf{c}$	$\mathbf{a}-\mathbf{b}$	$\mathbf{c}$	$-(\mathbf{a}+\mathbf{b})$
$(h\overline{h}0\overline{l})$	$(\mathbf{a}+\mathbf{b})$	$n(\mathbf{a}-\mathbf{b}) + m\mathbf{c}$	$p(\mathbf{a}-\mathbf{b}) - q\mathbf{c}$			
l odd $\Rightarrow n = l,\ m = 2h$; l even $\Rightarrow n = l/2,\ m = h$						
$(\overline{h}2h\overline{h}l)$	$2\mathbf{a}+\mathbf{b}$	$n\mathbf{b} - m\mathbf{c}$	$p\mathbf{b} + q\mathbf{c}$	$\mathbf{b}$	$\mathbf{c}$	$2\mathbf{a}+\mathbf{b}$
$(\overline{h}2h\overline{h}\overline{l})$	$-(2\mathbf{a}+\mathbf{b})$	$n\mathbf{b} + m\mathbf{c}$	$p\mathbf{b} - q\mathbf{c}$			
$(\overline{hh}2hl)$	$\mathbf{b}-\mathbf{a}$	$-n(\mathbf{a}+\mathbf{b}) - m\mathbf{c}$	$-p(\mathbf{a}+\mathbf{b}) + q\mathbf{c}$	$-(\mathbf{a}+\mathbf{b})$	$\mathbf{c}$	$\mathbf{b}-\mathbf{a}$
$(\overline{hh}2h\overline{l})$	$\mathbf{a}-\mathbf{b}$	$-n(\mathbf{a}+\mathbf{b}) + m\mathbf{c}$	$-p(\mathbf{a}+\mathbf{b}) - q\mathbf{c}$			
$(2h\overline{h}\overline{h}l)$	$-(\mathbf{a}+2\mathbf{b})$	$n\mathbf{a} - m\mathbf{c}$	$p\mathbf{a} + q\mathbf{c}$	$\mathbf{a}$	$\mathbf{c}$	$-\mathbf{a}+2\mathbf{b}$
$(2h\overline{h}\overline{h}\overline{l})$	$\mathbf{a}+2\mathbf{b}$	$n\mathbf{a} + m\mathbf{c}$	$p\mathbf{a} - q\mathbf{c}$			
l odd $\Rightarrow n = l,\ m = 2h$; l 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	$P622$	$P6_122$	$P6_522$	$P6_222$	$P6_422$	$P6_322$
$(mn\overline{m+n}0)$	$P112$	$P112_1$	$P112_1$	$P112$	$P112$	$P112_1$
$(\overline{m+n}mn0)$						
$(n\overline{m+n}m0)$						
$(nm\overline{m+n}0)$						
$(\overline{m+n}nm0)$						
$(m\overline{m+n}n0)$						
Reference group $B112$ with respect to origin at:						
$(0h\overline{h}l)$	P	P	P	P	P	P
$(0h\overline{h}\overline{l})$						
$(\overline{h}0hl)$		$P + \mathbf{c}/3$	$P + \mathbf{c}/6$	$P + \mathbf{c}/6$	$P + \mathbf{c}/3$	
$(\overline{h}0h\overline{l})$						
$(h\overline{h}0l)$		$P + \mathbf{c}/6$	$P + \mathbf{c}/3$	$P + \mathbf{c}/3$	$P + \mathbf{c}/6$	
$(h\overline{h}0\overline{l})$						
$(\overline{h}2h\overline{h}l)$	P	$P + \mathbf{c}/12$	$P + 5\mathbf{c}/12$	$P + \mathbf{c}/6$	$P + \mathbf{c}/3$	$P + \mathbf{c}/4$
$(\overline{h}2h\overline{h}\overline{l})$						
$(\overline{hh}2hl)$		$P + 5\mathbf{c}/12$	$P + \mathbf{c}/12$	$P + \mathbf{c}/3$	$P + \mathbf{c}/6$	
$(\overline{hh}2h\overline{l})$						
$(2h\overline{h}\overline{h}l)$		$P + \mathbf{c}/4$	$P + \mathbf{c}/4$	P	P	
$(2h\overline{h}\overline{h}\overline{l})$						