

Orthorhombic

6. SCANNING TABLES

Laue class $D_{2h} - mmm$ No. 54 *Pcca* D_{2h}^8

$$\mathcal{G} = P_{c \ c \ a}^{2_1 \ 2_1 \ 2_1}$$

Orientation orbit (<i>hkl</i>)	Conventional basis of the scanning group a' b' d	Scanning group \mathcal{H}	Linear orbit sd	Sectional layer group $\mathcal{L}(\mathbf{sd})$	
(001)	a b c	<i>Pcca</i>	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}]$	<i>p112/a</i> <i>p2₁22 (a/4)</i> <i>p112 (a/4)</i>	L07 L20 L03
(100)	b c a	<i>Pbcb</i>	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}]$	<i>p2/b11</i> <i>pb2b</i> <i>pb11</i>	L16 L30 L12
(010)	c a b	<i>Pbaa</i>	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[\mathbf{sd}, -\mathbf{sd}]$	<i>pbaa</i> <i>pba2 (a'/4)</i>	L43 L25

No. 55 *Pbam* D_{2h}^9

$$\mathcal{G} = P_{b \ a \ m}^{2_1 \ 2_1 \ 2_1}$$

Orientation orbit (<i>hkl</i>)	Conventional basis of the scanning group a' b' d	Scanning group \mathcal{H}	Linear orbit sd	Sectional layer group $\mathcal{L}(\mathbf{sd})$	
(001)	a b c	<i>Pbam</i>	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[\mathbf{sd}, -\mathbf{sd}]$	<i>pbam</i> <i>pba2</i>	L44 L25
(100)	b c a	<i>Pcma</i>	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}]$	<i>p12/m1</i> <i>p2₁ma</i> <i>p1m1</i>	L14 L28 L11
(010)	c a b	<i>Pmcb</i>	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}]$	<i>p2/m11</i> <i>pm2₁b</i> <i>pm11</i>	L14 L28 L11

No. 56 *Pccn* D_{2h}^{10}

$$\mathcal{G} = P_{c \ c \ n}^{2_1 \ 2_1 \ 2_1}$$

Orientation orbit (<i>hkl</i>)	Conventional basis of the scanning group a' b' d	Scanning group \mathcal{H}	Linear orbit sd	Sectional layer group $\mathcal{L}(\mathbf{sd})$	
(001)	a b c	<i>Pccn</i>	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}]$	<i>p112/n</i> <i>p2₁2₁2 [(a+b)/4]</i> <i>p112 [(a+b)/4]</i>	L07 L21 L03
(100)	b c a	<i>Pbnb</i>	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}]$	<i>p2₁/b11</i> <i>pb2b (a'/4)</i> <i>pb11 (a'/4)</i>	L17 L30 L12
(010)	c a b	<i>Pnaa</i>	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}]$	<i>p12₁/a1</i> <i>p2aa (b'/4)</i> <i>p1a1 (b'/4)</i>	L17 L30 L12

Auxiliary tables for Laue class $D_{2h} - mmm$ Centring types P and I

Orientation orbit (hkl)	Conventional basis of the scanning group			Auxiliary basis of the scanning group		
	\mathbf{a}'	\mathbf{b}'	\mathbf{d}	$\hat{\mathbf{a}}$	$\hat{\mathbf{b}}$	$\hat{\mathbf{c}}$
($mn0$)	\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}	$n\mathbf{a} + m\mathbf{b}$	$-p\mathbf{a} + q\mathbf{b}$			
($0mn$)	\mathbf{a}	$n\mathbf{b} - m\mathbf{c}$	$p\mathbf{b} + q\mathbf{c}$	\mathbf{b}	\mathbf{c}	\mathbf{a}
($0\bar{m}n$)	\mathbf{a}	$n\mathbf{b} + m\mathbf{c}$	$-p\mathbf{b} + q\mathbf{c}$			
($n0m$)	\mathbf{b}	$n\mathbf{c} - m\mathbf{a}$	$p\mathbf{c} + q\mathbf{a}$	\mathbf{c}	\mathbf{a}	\mathbf{b}
($n0\bar{m}$)	\mathbf{b}	$n\mathbf{c} + m\mathbf{a}$	$-p\mathbf{c} + q\mathbf{a}$			

Arithmetic class $222P$

Serial No.	16	17	18	19
Group type	D_2^1	D_2^2	D_2^3	D_2^4
Group	$P222$	$P222_1$	$P2_12_12$	$P2_12_12_1$
($mn0$)	$P112$	$P112_1$	$P112$	$P112_1$
($\bar{m}n0$)				($\mathbf{a}/4$)
($0mn$)		$P112$	$P112_1$	$P112_1$
($0\bar{m}n$)			($\mathbf{b}/4$)	($\mathbf{b}/4$)
($n0m$)		$P112$	$P112_1$	$P112_1$
($n0\bar{m}$)		($\mathbf{c}/4$)	($\mathbf{a}/4$)	($\mathbf{c}/4$)

Arithmetic class $mm2P$

Serial No.	25	26	27	28	29	30	31	32	33	34
Group type	C_{2v}^1	C_{2v}^2	C_{2v}^3	C_{2v}^4	C_{2v}^5	C_{2v}^6	C_{2v}^7	C_{2v}^8	C_{2v}^9	C_{2v}^{10}
Group	$Pmm2$	$Pmc2_1$	$Pcc2$	$Pma2$	$Pca2_1$	$Pnc2$	$Pmn2_1$	$Pba2$	$Pna2_1$	$Pnm2$
($mn0$)	$P112$	$P112_1$	$P112$	$P112$	$P112_1$	$P112$	$P112_1$	$P112$	$P112_1$	$P112$
($\bar{m}n0$)							($\mathbf{a}/4$)			
($0mn$)	$P11m$	$P11m$	$P11b$	$P11m$	$P11b$	$P11n$	$P11m$	$P11a$	$P11n$	$P11n$
($0\bar{m}n$)				($\mathbf{a}/4$)	($\mathbf{a}/4$)			($\mathbf{a}/4$)	($\mathbf{a}/4$)	($\mathbf{a}/4$)
($n0m$)		$P11a$	$P11a$	$P11b$	$P11b$	$P11a$	$P11n$	$P11b$	$P11b$	$P11n$
($n0\bar{m}$)						($\mathbf{b}/4$)		($\mathbf{b}/4$)	($\mathbf{b}/4$)	($\mathbf{b}/4$)

Arithmetic classes $222I$, $mm2I$ and $mmmI$

Serial No.	23	24	44	45	46	71	72	73	74
Group type	D_2^8	D_{2v}^9	C_{2v}^{20}	C_{2v}^{21}	C_{2v}^{22}	D_{2h}^{25}	D_{2h}^{26}	D_{2h}^{27}	D_{2h}^{28}
Group	$I222$	$I2_12_12_1$	$Imm2$	$Iba2$	$Ima2$	$Immm$	$Ibam$	$Ibca$	$Imma$
($mn0$)	$I112$	$I112$	$I112$	$I112$	$I112$	$I112/m$	$I112/m$	$I112/b$	$I112/b$
($\bar{m}n0$)		($\mathbf{b}/4$)							
($0mn$)		$I112$	$I11m$	$I11b$	$I11m$		$I112/b$		$I112/m$
($0\bar{m}n$)		($\mathbf{c}/4$)			($\mathbf{a}/4$)				
($n0m$)		$I112$		$I11a$	$I11b$		$I112/a$		$I112/m$
($n0\bar{m}$)		($\mathbf{a}/4$)							$[(\mathbf{a} + \mathbf{b} + \mathbf{c})/4]$

Arithmetic class $mmmP$

Serial No. Group type Group	47 D_{2h}^1 $Pmmm$	48 D_{2h}^2 $Pnnn$		49 D_{2h}^3 $Pccm$	50 D_{2h}^4 $Pban$	
		Origin 1	Origin 2		Origin 1	Origin 2
$(mn0)$ $(\bar{m}n0)$	$P112/m$	$P112/n$ $[(a + b + c)/4]$	$P112/n$	$P112/m$	$P112/n$ $[(a + b)/4]$	$P112/n$
$(0mn)$ $(0\bar{m}n)$				$P112/b$	$P112/a$ $[(a + b)/4]$	$P112/a$
$(n0m)$ $(n0\bar{m})$				$P112/a$	$P112/b$ $[(a + b)/4]$	$P112/b$

Serial No. Group type Group	51 D_{2h}^5 $Pmma$	52 D_{2h}^6 $Pnna$	53 D_{2h}^7 $Pmna$	54 D_{2h}^8 $Pcca$	55 D_{2h}^9 $Pbam$	56 D_{2h}^{10} $Pccn$
	$(mn0)$ $(\bar{m}n0)$	$P112/a$	$P112/a$	$P112_1/a$	$P112/a$	$P112/m$
$(0mn)$ $(0\bar{m}n)$	$P112_1/m$	$P112/n$	$P112/m$	$P112_1/b$	$P112_1/a$	$P112_1/b$
$(n0m)$ $(n0\bar{m})$	$P112/m$	$P112_1/n$	$P112/n$	$P112/a$	$P112_1/b$	$P112_1/a$

Serial No. Group type Group	57 D_{2h}^{11} $Pbcm$	58 D_{2h}^{12} $Pnnm$	59 D_{2h}^{13} $Pmnn$		60 D_{2h}^{14} $Pbcn$	61 D_{2h}^{15} $Pbca$	62 D_{2h}^{16} $Pnma$
			Origin 1	Origin 2			
$(mn0)$ $(\bar{m}n0)$	$P112_1/m$	$P112/m$	$P112/n$ $[(a + b)/4]$	$P112/n$	$P112_1/n$	$P112_1/a$	$P112_1/a$
$(0mn)$ $(0\bar{m}n)$	$P112/a$	$P112_1/n$	$P112_1/m$ $[(a + b)/4]$	$P112_1/m$	$P112_1/a$		$P112_1/n$
$(n0m)$ $(n0\bar{m})$	$P112_1/a$				$P112/a$		$P112_1/m$

Centring type C

Orientation orbit (hkl)	Conventional basis of the scanning group \mathbf{a}' \mathbf{b}' \mathbf{d}			Auxiliary basis of the scanning group $\hat{\mathbf{a}}$ $\hat{\mathbf{b}}$ $\hat{\mathbf{c}}$		
$(hk0)$	\mathbf{c}	$n\hat{\mathbf{a}} - m\hat{\mathbf{b}}$	$p\hat{\mathbf{a}} + q\hat{\mathbf{b}}$	$(\mathbf{a} - \mathbf{b})/2$	$(\mathbf{a} + \mathbf{b})/2$	\mathbf{c}
$(\bar{h}k0)$	\mathbf{c}	$n\hat{\mathbf{a}} + m\hat{\mathbf{b}}$	$-p\hat{\mathbf{a}} + q\hat{\mathbf{b}}$			
h even, k odd or h odd, k even $\Rightarrow n = h + k, m = h - k$						
h, k odd $\Rightarrow n = (h + k)/2, m = (h - k)/2$						
$(0mn)$	\mathbf{a}	$n\mathbf{b} - m\mathbf{c}$	$p\mathbf{b} + q\mathbf{c}$	\mathbf{b}	\mathbf{c}	\mathbf{a}
$(0\bar{m}n)$	\mathbf{a}	$n\mathbf{b} + m\mathbf{c}$	$-p\mathbf{b} + q\mathbf{c}$			
$(n0m)$	\mathbf{b}	$n\mathbf{c} - m\mathbf{a}$	$p\mathbf{c} + q\mathbf{a}$	\mathbf{c}	\mathbf{a}	\mathbf{b}
$(n0\bar{m})$	\mathbf{b}	$n\mathbf{c} + m\mathbf{a}$	$-p\mathbf{c} + q\mathbf{a}$			