

Laue class $D_{2h} - mmm$

6. SCANNING TABLES

Orthorhombic

No. 51 $Pmma$ D_{2h}^5

$$\mathcal{G} = P \begin{matrix} 2 & 2 & 2 \\ m & m & a \end{matrix}$$

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	$Pmma$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ [$\mathbf{sd}, -\mathbf{sd}$]	$pmma$ $pmm2 (\mathbf{a}/4)$	L41 L23
(100)	b c a	$Pmcm$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ [$\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}$]	$p2/m11$ $pm2m$ $pm11$	L14 L27 L11
(010)	c a b	$Pbmm$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ [$\mathbf{sd}, -\mathbf{sd}$]	$pbmm$ $pbm2$	L40 L24

No. 52 $Pnna$ D_{2h}^6

$$\mathcal{G} = P \begin{matrix} 2 & 2_1 & 2 \\ n & n & a \end{matrix}$$

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	$Pnna$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ [$\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}$]	$p112/a$ $p22_12 (\mathbf{a}/4)$ $p112 (\mathbf{a}/4)$	L07 L20 L03
(100)	b c a	$Pncn$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ [$\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}$]	$p112/n$ $p2_122 [(\mathbf{a}' + \mathbf{b}')/4]$ $p112 [(\mathbf{a}' + \mathbf{b}')/4]$	L07 L20 L03
(010)	c a b	$Pbnn$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ [$\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}$]	$p2/b11$ $pb2n (\mathbf{a}'/4)$ $pb11$	L16 L34 L12

No. 53 $Pmna$ D_{2h}^7

$$\mathcal{G} = P \begin{matrix} 2 & 2 & 2_1 \\ m & n & a \end{matrix}$$

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	$Pmna$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ [$\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}$]	$p2/m11$ $pm2a (\mathbf{a}/4)$ $pm11$	L14 L31 L11
(100)	b c a	$Pncm$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ [$\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}$]	$p112/m$ $p22_12$ $p112$	L06 L20 L03
(010)	c a b	$Pbmn$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ [$\mathbf{sd}, -\mathbf{sd}$]	$pbmn$ $pbm2 [(\mathbf{a}' + \mathbf{b}')/4]$	L42 L24

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.	47	48		49	50	
Group type	D_{2h}^1	D_{2h}^2		D_{2h}^3	D_{2h}^4	
Group	$Pmmm$	$Pnnn$		$Pccm$	$Pban$	
		Origin 1	Origin 2		Origin 1	Origin 2
$(mn0)$	$P112/m$	$P112/n$ [[a + b + c]/4]	$P112/n$	$P112/m$	$P112/n$	$P112/n$
$(\bar{m}n0)$					[[a + b]/4]	
$(0mn)$				$P112/b$	$P112/a$	$P112/a$
$(0\bar{m}n)$					[[a + b]/4]	
$(n0m)$				$P112/a$	$P112/b$	$P112/b$
$(n0\bar{m})$					[[a + b]/4]	

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

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

Centring type C

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