

Orthorhombic

6. SCANNING TABLES

Laue class $D_{2h} - mmm$ No. 65 $Cmmm$ D_{2h}^{19}

$$\mathcal{G} = C_{m m m}^{\frac{2}{2} \frac{2}{2} \frac{2}{2}}$$

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	$Cmmm$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ [$\mathbf{sd}, -\mathbf{sd}$]	$cmmm$ $cmm2$	L47 L26
(100)	b c a	$Bmmm$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ [$\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}$] [$\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}$]	$pmmm$ $pmma$ (a' /4) $pmm2$	L37 L41 L23
(010)	c a b	$Ammm$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ [$\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}$] [$\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}$]	$pmmm$ $pmm2$ (b' /4) $pmm2$	L37 L41 L23

No. 66 $Cccm$ D_{2h}^{20}

$$\mathcal{G} = C_{c c m}^{\frac{2}{2} \frac{2}{2} \frac{2}{2}}$$

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	$Cccm$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ [$\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}$] [$\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}$]	$\widehat{p}112/m$ $c222$ $\widehat{p}112$	L06 L22 L03
(100)	b c a	$Bbmb$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ [$\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}$] [$\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}$]	$pbmb$ $pbmn$ (a' /4) $pbm2$ (b' /4)	L38 L42 L24
(010)	c a b	$Amaa$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ [$\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}$] [$\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}$]	$pmaa$ $pman$ (b' /4) $pma2$ (a' /4)	L38 L42 L24

No. 67* $Cmme$ D_{2h}^{21}

$$\mathcal{G} = C_{m m a}^{\frac{2}{2} \frac{2}{2} \frac{2}{2}}$$

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	$Cmma$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ [$\mathbf{sd}, -\mathbf{sd}$]	$cmme$ $cmm2$ (b /4)	L48 L26
(100)	b c a	$Bmcm$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ [$\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}$] [$\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}$]	$pmam$ $pmaa$ (a' /4) $pma2$	L40 L38 L24
(010)	c a b	$Abmm$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ [$\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}$] [$\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}$]	$pbmb$ $pbmm$ (b' /4) $pbm2$ (b' /4)	L38 L40 L24

*New symbol. Old symbol: $Cmma$.

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}	$n\mathbf{c} + m\mathbf{a}$	$-p\mathbf{c} + q\mathbf{a}$			

Arithmetic classes $222C$ and $mm2C$

Serial No.	20	21	35	36	37
Group type	D_2^5	D_2^6	C_{2v}^{11}	C_{2v}^{12}	C_{2v}^{13}
Group	$C222_1$	$C222$	$Cmm2$	$Cmc2_1$	$Ccc2$
$(hk0)$	$P112_1$	$P112$	$P112$	$P112_1$	$P112$
$(\bar{h}k0)$					
$(0mn)$	$B112$	$B112$	$B11m$	$B11m$	$B11b$
$(0\bar{m}n)$					
$(n0m)$	$A112$	$A112$	$A11m$	$A11a$	$A11a$
$(n0\bar{m})$	$(c/4)$				

Arithmetic class $mmmC$

Serial No.	63	64	65	66	67	68	
Group type	D_{2h}^{17}	D_{2h}^{18}	D_{2h}^{19}	D_{2h}^{20}	D_{2h}^{21}	D_{2h}^{22}	
Group	$Cmcm$	$Cmce$	$Cmmm$	$Cccm$	$Cmme$	$Ccce$	
						Origin 1	Origin 2
$(hk0)$	$P112_1/m$	$P112_1/n$	$P112/m$	$P112/m$	$P112/n$	$P112/n$	$P112/n$
$(\bar{h}k0)$						$[(b+c)/4]$	
$(0mn)$	$B112/m$	$B112/m$	$B112/m$	$B112/b$	$B112/m$	$B112/n$	$B112/n$
$(0\bar{m}n)$						$[(a+c)/4]$	
$(n0m)$	$A112/a$	$A112/n$	$A112/m$	$A112/a$	$A112/m$	$A112/a$	$A112/a$
$(n0\bar{m})$					$[(a+b)/4]$	$[(b+c)/4]$	

Centring type A

Orientation orbit	Conventional basis of the scanning group			Auxiliary basis of the scanning group		
(hkl)	\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}	$n\mathbf{a} + m\mathbf{b}$	$-p\mathbf{a} + q\mathbf{b}$			
$(0kl)$	\mathbf{a}	$n\hat{\mathbf{a}} - m\hat{\mathbf{b}}$	$p\hat{\mathbf{a}} + q\hat{\mathbf{b}}$	$(b-c)/2$	$(b+c)/2$	\mathbf{a}
$(\bar{k}l0)$	\mathbf{a}	$n\hat{\mathbf{a}} + m\hat{\mathbf{b}}$	$-p\hat{\mathbf{a}} + q\hat{\mathbf{b}}$			
k even, l odd or k odd, l even $\Rightarrow n = k + l, m = k - l$						
k, l odd $\Rightarrow n = (k + l)/2, m = (k - l)/2$						
$(n0m)$	\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 $mm2A$

Serial No.	38	39	40	41
Group type	C_{2v}^{14}	C_{2v}^{15}	C_{2v}^{16}	C_{2v}^{17}
Group	$Amm2$	$Aem2$	$Ama2$	$Aea2$
$(mn0)$	$A112$	$A112$	$A112$	$A112$
$(\bar{m}n0)$				
$(0kl)$	$P11m$	$P11n$	$P11m$	$P11n$
$(0\bar{k}l)$			$(a/4)$	$(a/4)$
$(n0m)$	$B11m$	$B11m$	$B11b$	$B11b$
$(n0\bar{m})$		$(b/4)$		$(b/4)$