Orthorhombic   6. SCANNING TABLES   Laue class $D_{2h} - mmm$

No. 37   *Ccc*2 C_{2v}^{13}

$$\mathcal{G} = Ccc2$$

Orientation orbit (hkl)	Conventional basis of the scanning group $\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
(001)	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$	$Ccc2$	$[s\mathbf{d}, (s+\frac{1}{2})\mathbf{d}]$	$\widehat{p}112$	L03
(100)	$\mathbf{b}$	$\mathbf{c}$	$\mathbf{a}$	$Bb2b$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$pb2b$	L30
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$pb2n\ (\mathbf{a}'/4)$	L34
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$pb11$	L12
(010)	$\mathbf{c}$	$\mathbf{a}$	$\mathbf{b}$	$A2aa$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p2aa$	L30
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p2an\ (\mathbf{b}'/4)$	L34
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$p1a1$	L12

No. 38   *Amm*2 C_{2v}^{14}

$$\mathcal{G} = Amm2$$

Orientation orbit (hkl)	Conventional basis of the scanning group $\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
(001)	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$	$Amm2$	$[s\mathbf{d}, (s+\frac{1}{2})\mathbf{d}]$	$pmm2$	L23
(100)	$\mathbf{b}$	$\mathbf{c}$	$\mathbf{a}$	$Cm2m$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$	$cm2m$	L35
					$[s\mathbf{d}, -s\mathbf{d}]$	$cm11$	L13
(010)	$\mathbf{c}$	$\mathbf{a}$	$\mathbf{b}$	$B2mm$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p2mm$	L27
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p2_1ma$	L28
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$p1m1$	L11

No. 39[*]   *Aem*2 C_{2v}^{15}

$$\mathcal{G} = Abm2$$

Orientation orbit (hkl)	Conventional basis of the scanning group $\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
(001)	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$	$Abm2$	$[s\mathbf{d}, (s+\frac{1}{2})\mathbf{d}]$	$pbm2$	L24
(100)	$\mathbf{b}$	$\mathbf{c}$	$\mathbf{a}$	$Cm2a$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$	$cm2e$	L36
					$[s\mathbf{d}, -s\mathbf{d}]$	$cm11\ (\mathbf{a}'/4)$	L13
(010)	$\mathbf{c}$	$\mathbf{a}$	$\mathbf{b}$	$B2cm$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p2aa$	L30
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p2_1am$	L29
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$p1a1$	L12

[*]New symbol. Old symbol: *Abm*2.

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
$(mn0)$ $(\overline{m}n0)$	*P*112/*m*	*P*112/*n* $[(\mathbf{a}+\mathbf{b}+\mathbf{c})/4]$	*P*112/*n*	*P*112/*m*	*P*112/*n* $[(\mathbf{a}+\mathbf{b})/4]$	*P*112/*n*
$(0mn)$ $(0\overline{m}n)$				*P*112/*b*	*P*112/*a* $[(\mathbf{a}+\mathbf{b})/4]$	*P*112/*a*
$(n0m)$ $(n0\overline{m})$				*P*112/*a*	*P*112/*b* $[(\mathbf{a}+\mathbf{b})/4]$	*P*112/*b*

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*
$(mn0)$ $(\overline{m}n0)$	*P*112/*a*	*P*112/*a*	*P*112₁/*a*	*P*112/*a*	*P*112/*m*	*P*112/*n*
$(0mn)$ $(0\overline{m}n)$	*P*112₁/*m*	*P*112/*n*	*P*112/*m*	*P*112₁/*b*	*P*112₁/*a*	*P*112₁/*b*
$(n0m)$ $(n0\overline{m})$	*P*112/*m*	*P*112₁/*n*	*P*112/*n*	*P*112/*a*	*P*112₁/*b*	*P*112₁/*a*

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*	*Pnnm*	*Pmmn*		*Pbcn*	*Pbca*	*Pnma*
			Origin 1	Origin 2			
$(mn0)$ $(\overline{m}n0)$	*P*112₁/*m*	*P*112/*m*	*P*112/*n* $[(\mathbf{a}+\mathbf{b})/4]$	*P*112/*n*	*P*112₁/*n*	*P*112₁/*a*	*P*112₁/*a*
$(0mn)$ $(0\overline{m}n)$	*P*112/*a*	*P*112₁/*n*	*P*112₁/*m* $[(\mathbf{a}+\mathbf{b})/4]$	*P*112₁/*m*	*P*112₁/*a*		*P*112₁/*n*
$(n0m)$ $(n0\overline{m})$	*P*112₁/*a*				*P*112/*a*		*P*112₁/*m*

Centring type *C*

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

Arithmetic classes 222*C* and *mm*2*C*

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	$C222_1$	$C222$	$Cmm2$	$Cmc2_1$	$Ccc2$
$(hk0)$ $(\overline{h}k0)$	$P112_1$	$P112$	$P112$	$P112_1$	$P112$
$(0mn)$ $(0\overline{m}n)$	$B112$	$B112$	$B11m$	$B11m$	$B11b$
$(n0m)$ $(n0\overline{m})$	$A112$ $(\mathbf{c}/4)$	$A112$	$A11m$	$A11a$	$A11a$

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
$(hk0)$ $(\overline{h}k0)$	$P112_1/m$	$P112_1/n$	$P112/m$	$P112/m$	$P112/n$	$P112/n$ $[(\mathbf{b}+\mathbf{c})/4]$	$P112/n$
$(0mn)$ $(0\overline{m}n)$	$B112/m$	$B112/m$	$B112/m$	$B112/b$	$B112/m$	$B112/n$ $[(\mathbf{a}+\mathbf{c})/4]$	$B112/n$
$(n0m)$ $(n0\overline{m})$	$A112/a$	$A112/n$	$A112/m$	$A112/a$	$A112/m$ $[(\mathbf{a}+\mathbf{b})/4]$	$A112/a$ $[(\mathbf{b}+\mathbf{c})/4]$	$A112/a$

Centring type *A*

Orientation orbit (hkl)	Conventional basis of the scanning group			Auxiliary basis of the scanning group		
	$\mathbf{a}'$ $\mathbf{b}'$		$\mathbf{d}$	$\widehat{\mathbf{a}}$	$\widehat{\mathbf{b}}$	$\widehat{\mathbf{c}}$
$(mn0)$ $(\overline{m}n0)$	$\mathbf{c}$ $\mathbf{c}$	$n\mathbf{a}-m\mathbf{b}$ $n\mathbf{a}+m\mathbf{b}$	$p\mathbf{a}+q\mathbf{b}$ $-p\mathbf{a}+q\mathbf{b}$	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$
$(0kl)$ $(\overline{k}l0)$	$\mathbf{a}$ $\mathbf{a}$	$n\widehat{\mathbf{a}}-m\widehat{\mathbf{b}}$ $n\widehat{\mathbf{a}}+m\widehat{\mathbf{b}}$	$p\widehat{\mathbf{a}}+q\widehat{\mathbf{b}}$ $-p\widehat{\mathbf{a}}+q\widehat{\mathbf{b}}$	$(\mathbf{b}-\mathbf{c})/2$	$(\mathbf{b}+\mathbf{c})/2$	$\mathbf{a}$
	k even, l odd or k odd, l even $\Rightarrow n=k+l, m=k-l$ k, l odd $\Rightarrow n=(k+l)/2, m=(k-l)/2$					
$(n0m)$ $(n0\overline{m})$	$\mathbf{b}$ $\mathbf{b}$	$n\mathbf{c}-m\mathbf{a}$ $n\mathbf{c}+m\mathbf{a}$	$p\mathbf{c}+q\mathbf{a}$ $-p\mathbf{c}+q\mathbf{a}$	$\mathbf{c}$	$\mathbf{a}$	$\mathbf{b}$

Arithmetic class *mm*2*A*

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