No. 57 *Pbcm* D_{2h}^{11}

$$\mathcal{G} = P\,\frac{2}{b}\,\frac{2_1}{c}\,\frac{2_1}{m}$$

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)	**a**	**b**	**c**	*Pbcm*	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p2/b11$	L16
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$pb2_1m$	L29
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$pb11$	L12
(100)	**b**	**c**	**a**	*Pbma*	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$	$pbma$	L45
					$[s\mathbf{d}, -s\mathbf{d}]$	$pbm2$ $(\mathbf{a}'/4)$	L24
(010)	**c**	**a**	**b**	*Pmca*	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p2_1/m11$	L15
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$pm2a$	L31
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$pm11$ $(\mathbf{a}'/4)$	L11

No. 58 *Pnnm* D_{2h}^{12}

$$\mathcal{G} = P\,\frac{2_1}{n}\,\frac{2_1}{n}\,\frac{2}{m}$$

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)	**a**	**b**	**c**	*Pnnm*	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p112/m$	L06
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p2_12_12$	L21
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$p112$	L03
(100)	**b**	**c**	**a**	*Pnmn*	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p12/m1$	L14
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p2_1mn$	L32
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$p1m1$	L11
(010)	**c**	**a**	**b**	*Pmnn*	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p2/m11$	L14
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$pm2_1n$	L32
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$pm11$	L11

No. 59 *Pmmn* D_{2h}^{13}

$$\mathcal{G} = P\,\frac{2_1}{m}\,\frac{2_1}{m}\,\frac{2}{n} \quad \text{origin 1}$$

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)	**a**	**b**	**c**	*Pmmn*	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$	$pmmn$ $[(\mathbf{a}+\mathbf{b})/4]$	L46
				$[(\mathbf{a}+\mathbf{b})/4]$	$[s\mathbf{d}, -s\mathbf{d}]$	$pmm2$	L23
(100)	**b**	**c**	**a**	*Pmnm*	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$pm2m$	L27
				$[(\mathbf{a}'+\mathbf{d})/4]$	$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p2_1/m11$ $(\mathbf{a}'/4)$	L15
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$pm11$	L11
(010)	**c**	**a**	**b**	*Pnmm*	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p2mm$	L27
				$[(\mathbf{b}'+\mathbf{d})/4]$	$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p12_1/m1$ $(\mathbf{b}'/4)$	L15
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$p1m1$	L11

Auxiliary tables for Laue class D_{2h} – *mmm*

Centring types *P* and *I*

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

Arithmetic class 222*P*

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

Arithmetic class *mm*2*P*

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	$Pmm2$	$Pmc2_1$	$Pcc2$	$Pma2$	$Pca2_1$	$Pnc2$	$Pmn2_1$	$Pba2$	$Pna2_1$	$Pnn2$
$(mn0)$ $(\overline{m}n0)$	$P112$	$P112_1$	$P112$	$P112$	$P112_1$	$P112$	$P112_1$ $(\mathbf{a}/4)$	$P112$	$P112_1$	$P112$
$(0mn)$ $(0\overline{m}n)$	$P11m$	$P11m$	$P11b$	$P11m$ $(\mathbf{a}/4)$	$P11b$ $(\mathbf{a}/4)$	$P11n$	$P11m$	$P11a$ $(\mathbf{a}/4)$	$P11n$ $(\mathbf{a}/4)$	$P11n$ $(\mathbf{a}/4)$
$(n0m)$ $(n0\overline{m})$		$P11a$	$P11a$	$P11b$	$P11b$	$P11a$ $(\mathbf{b}/4)$	$P11n$	$P11b$ $(\mathbf{b}/4)$	$P11b$ $(\mathbf{b}/4)$	$P11n$ $(\mathbf{b}/4)$

Arithmetic classes 222*I*, *mm*2*I* 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	$I222$	$I2_12_12_1$	$Imm2$	$Iba2$	$Ima2$	$Immm$	$Ibam$	$Ibca$	$Imma$
$(mn0)$ $(\overline{m}n0)$	$I112$	$I112$ $(\mathbf{b}/4)$	$I112$	$I112$	$I112$	$I112/m$	$I112/m$	$I112/b$	$I112/b$
$(0mn)$ $(0\overline{m}n)$		$I112$ $(\mathbf{c}/4)$	$I11m$	$I11b$	$I11m$ $(\mathbf{a}/4)$		$I112/b$		$I112/m$
$(n0m)$ $(n0\overline{m})$		$I112$ $(\mathbf{a}/4)$		$I11a$	$I11b$		$I112/a$		$I112/m$ $[(\mathbf{a}+\mathbf{b}+\mathbf{c})/4]$

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
$(mn0)$ $(\overline{m}n0)$	$P112/m$	$P112/n$ $[(\mathbf{a}+\mathbf{b}+\mathbf{c})/4]$	$P112/n$	$P112/m$	$P112/n$ $[(\mathbf{a}+\mathbf{b})/4]$	$P112/n$
$(0mn)$ $(0\overline{m}n)$				$P112/b$	$P112/a$ $[(\mathbf{a}+\mathbf{b})/4]$	$P112/a$
$(n0m)$ $(n0\overline{m})$				$P112/a$	$P112/b$ $[(\mathbf{a}+\mathbf{b})/4]$	$P112/b$

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*
$(mn0)$ $(\overline{m}n0)$	$P112/a$	$P112/a$	$P112_1/a$	$P112/a$	$P112/m$	$P112/n$
$(0mn)$ $(0\overline{m}n)$	$P112_1/m$	$P112/n$	$P112/m$	$P112_1/b$	$P112_1/a$	$P112_1/b$
$(n0m)$ $(n0\overline{m})$	$P112/m$	$P112_1/n$	$P112/n$	$P112/a$	$P112_1/b$	$P112_1/a$

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

Centring type *C*

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