

Orthorhombic

6. SCANNING TABLES

Laue class $D_{2h} - mmm$ No. 49 $Pccm$ D_{2h}^3

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

Orientation orbit (<i>hkl</i>)	Conventional basis of the scanning group			Scanning group \mathcal{H}	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
	\mathbf{a}'	\mathbf{b}'	\mathbf{d}				
(001)	\mathbf{a}	\mathbf{b}	\mathbf{c}	$Pccm$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112/m$ $p222$ $p112$	L06 L19 L03
(100)	\mathbf{b}	\mathbf{c}	\mathbf{a}	$Pbmb$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[s\mathbf{d}, -s\mathbf{d}]$	$pbmb$ $pbm2 (\mathbf{b}'/4)$	L38 L24
(010)	\mathbf{c}	\mathbf{a}	\mathbf{b}	$Pmaa$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[s\mathbf{d}, -s\mathbf{d}]$	$pmaa$ $pma2 (\mathbf{a}'/4)$	L38 L24

No. 50 $Pban$ D_{2h}^4

$$\mathcal{G} = P_{b a n}^{\frac{2}{2} \frac{2}{2} \frac{2}{2}} \text{ origin 1}$$

Orientation orbit (<i>hkl</i>)	Conventional basis of the scanning group			Scanning group \mathcal{H}	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
	\mathbf{a}'	\mathbf{b}'	\mathbf{d}				
(001)	\mathbf{a}	\mathbf{b}	\mathbf{c}	$Pban$ $[(\mathbf{a} + \mathbf{b})/4]$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[s\mathbf{d}, -s\mathbf{d}]$	$pban [(\mathbf{a} + \mathbf{b})/4]$ $pba2$	L39 L25
(100)	\mathbf{b}	\mathbf{c}	\mathbf{a}	$Pcna$ $[(\mathbf{a}' + \mathbf{d})/4]$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p222$ $p112/a (\mathbf{a}'/4)$ $p112$	L19 L07 L03
(010)	\mathbf{c}	\mathbf{a}	\mathbf{b}	$Pncb$ $[(\mathbf{b}' + \mathbf{d})/4]$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p222$ $p112/b (\mathbf{b}'/4)$ $p112$	L19 L07 L03

No. 50 $Pban$ D_{2h}^4

$$\mathcal{G} = P_{b a n}^{\frac{2}{2} \frac{2}{2} \frac{2}{2}} \text{ origin 2}$$

Orientation orbit (<i>hkl</i>)	Conventional basis of the scanning group			Scanning group \mathcal{H}	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
	\mathbf{a}'	\mathbf{b}'	\mathbf{d}				
(001)	\mathbf{a}	\mathbf{b}	\mathbf{c}	$Pban$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[s\mathbf{d}, -s\mathbf{d}]$	$pban$ $pba2 [(\mathbf{a} + \mathbf{b})/4]$	L39 L25
(100)	\mathbf{b}	\mathbf{c}	\mathbf{a}	$Pcna$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112/a$ $p222 (\mathbf{a}'/4)$ $p112 (\mathbf{a}'/4)$	L07 L19 L03
(010)	\mathbf{c}	\mathbf{a}	\mathbf{b}	$Pncb$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$ $[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112/b$ $p222 (\mathbf{b}'/4)$ $p112 (\mathbf{b}'/4)$	L07 L19 L03

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		
	a'	b'	d	\hat{a}	\hat{b}	\hat{c}
$(mn0)$	c	$na - mb$	$pa + qb$	a	b	c
$(\bar{m}n0)$	c	$na + mb$	$-pa + qb$			
$(0mn)$	a	$nb - mc$	$pb + qc$	b	c	a
$(0\bar{m}n)$	a	$nb + mc$	$-pb + qc$			
$(n0m)$	b	$nc - ma$	$pc + qa$	c	a	b
$(n0\bar{m})$	b	$nc + ma$	$-pc + qa$			

Arithmetic class $222P$

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

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

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	$I222$	$I2_12_12_1$	$Imm2$	$Iba2$	$Ima2$	$Immm$	$Ibam$	$Ibca$	$Imma$		
$(mn0)$	$I112$	$I112$	$I112$	$I112$	$I112$	$I112/m$	$I112/m$	$I112/b$	$I112/b$		
$(\bar{m}n0)$		$(b/4)$									
$(0mn)$		$I112$	$I11m$	$I11b$	$I11m$				$I112/b$		$I112/m$
$(0\bar{m}n)$		$(c/4)$					$(a/4)$				
$(n0m)$	$I112$		$I11a$	$I11b$		$I112/a$		$I112/m$			
$(n0\bar{m})$	$(a/4)$							$(a + b + c)/4$			

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

Serial No. Group type Group	57 D_{2h}^{11} $Pbcm$	58 D_{2h}^{12} $Pnmm$	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]	$P112/n$	$P112_1/n$	$P112_1/a$	$P112_1/a$				
$(0mn)$ $(0\bar{m}n)$							$P112/a$	$P112_1/n$	$P112_1/m$	$P112_1/a$	$P112_1/n$
$(n0m)$ $(n0\bar{m})$							$P112_1/a$			$P112/a$	$P112_1/m$

Centring type C

Orientation orbit (hkl)	Conventional basis of the scanning group 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	$nb - mc$	$pb + qc$	b	c	a
$(0\bar{m}n)$	a	$nb + mc$	$-pb + qc$			
$(n0m)$	b	$nc - ma$	$pc + qa$	c	a	b
$(n0\bar{m})$	b	$nc + ma$	$-pc + qa$			