

Laue class  $D_{2h} - mmm$ 

6. SCANNING TABLES

Orthorhombic

 No. 19  $P2_12_12_1$ 

$$\mathcal{G} = P2_12_12_1$$

 $D_2^4$ 

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)	<b>a</b>	<b>b</b>	<b>c</b>	$P2_12_12_1$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p2_111$ ( $\mathbf{b}'/4$ )	L09
(100)	<b>b</b>	<b>c</b>	<b>a</b>		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p12_11$	L09
(010)	<b>c</b>	<b>a</b>	<b>b</b>		$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p1$	L01

 No. 20  $C222_1$ 

$$\mathcal{G} = C222_1$$

 $D_2^5$ 

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)	<b>a</b>	<b>b</b>	<b>c</b>	$C222_1$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$c211$	L10
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$c121$	L10
					$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$\widehat{p}1$	L01
(100)	<b>b</b>	<b>c</b>	<b>a</b>	$B22_12$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p22_12$	L20
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p2_12_12$	L21
					$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112$	L03
(010)	<b>c</b>	<b>a</b>	<b>b</b>	$A2_122$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p2_122$ ( $\mathbf{a}'/4$ )	L20
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p2_12_12$ ( $\mathbf{a}'/4$ )	L21
					$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112$ ( $\mathbf{a}'/4$ )	L03

 No. 21  $C222$ 

$$\mathcal{G} = C222$$

 $D_2^6$ 

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)	<b>a</b>	<b>b</b>	<b>c</b>	$C222$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$	$c222$	L22
					$[s\mathbf{d}, -s\mathbf{d}]$	$\widehat{p}112$	L03
(100)	<b>b</b>	<b>c</b>	<b>a</b>	$B222$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p222$	L19
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p2_122$	L20
					$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112$	L03
(010)	<b>c</b>	<b>a</b>	<b>b</b>	$A222$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p222$	L19
					$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p22_12$	L20
					$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112$	L03

 No. 22  $F222$ 

$$\mathcal{G} = F222$$

 $D_2^7$ 

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)	<b>a</b>	<b>b</b>	<b>c</b>	$F222$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$c222$	L22
(100)	<b>b</b>	<b>c</b>	<b>a</b>		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$c222$ [ $(\mathbf{a}' + \mathbf{b}')/4$ ]	L22
(010)	<b>c</b>	<b>a</b>	<b>b</b>		$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$\widehat{p}112$	L03

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

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			Auxiliary basis of the scanning group		
	$\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	$\hat{\mathbf{a}}$	$\hat{\mathbf{b}}$	$\hat{\mathbf{c}}$
$(hk0)$	$\mathbf{c}$	$n\hat{\mathbf{a}} - m\hat{\mathbf{b}}$	$p\hat{\mathbf{a}} + q\hat{\mathbf{b}}$	$(\mathbf{a} - \mathbf{b})/2$	$(\mathbf{a} + \mathbf{b})/2$	$\mathbf{c}$
$(\bar{h}k0)$	$\mathbf{c}$	$n\hat{\mathbf{a}} + m\hat{\mathbf{b}}$	$-p\hat{\mathbf{a}} + q\hat{\mathbf{b}}$			
$h$ 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	$C222_1$	$C222$	$Cmm2$	$Cmc2_1$	$Ccc2$
$(hk0)$ $(\bar{h}k0)$	$P112_1$	$P112$	$P112$	$P112_1$	$P112$
$(0mn)$ $(0\bar{m}n)$	$B112$	$B112$	$B11m$	$B11m$	$B11b$
$(n0m)$ $(n0\bar{m})$	$A112$ $(c/4)$	$A112$	$A11m$	$A11a$	$A11a$

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	$Cmcm$	$Cmce$	$Cmmm$	$Cccm$	$Cmme$	$Ccce$	
$(hk0)$ $(\bar{h}k0)$	$P112_1/m$	$P112_1/n$	$P112/m$	$P112/m$	$P112/n$	Origin 1 $[(b+c)/4]$	Origin 2 $P112/n$
$(0mn)$ $(0\bar{m}n)$	$B112/m$	$B112/m$	$B112/m$	$B112/b$	$B112/m$	$B112/n$ $[(a+c)/4]$	$B112/n$
$(n0m)$ $(n0\bar{m})$	$A112/a$	$A112/n$	$A112/m$	$A112/a$	$A112/m$ $[(a+b)/4]$	$A112/a$ $[(b+c)/4]$	$A112/a$

## Centring type A

Orientation orbit $(hkl)$	Conventional basis of the scanning group			Auxiliary basis of the scanning group		
	$\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	$\hat{\mathbf{a}}$	$\hat{\mathbf{b}}$	$\hat{\mathbf{c}}$
$(mn0)$	$\mathbf{c}$	$n\mathbf{a} - m\mathbf{b}$	$p\mathbf{a} + q\mathbf{b}$	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$
$(\bar{m}n0)$	$\mathbf{c}$	$n\mathbf{a} + m\mathbf{b}$	$-p\mathbf{a} + q\mathbf{b}$			
$(0kl)$	$\mathbf{a}$	$n\hat{\mathbf{a}} - m\hat{\mathbf{b}}$	$p\hat{\mathbf{a}} + q\hat{\mathbf{b}}$	$(b-c)/2$	$(b+c)/2$	$\mathbf{a}$
$(\bar{k}l0)$	$\mathbf{a}$	$n\hat{\mathbf{a}} + m\hat{\mathbf{b}}$	$-p\hat{\mathbf{a}} + q\hat{\mathbf{b}}$			
$k$ 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	$Amm2$	$Aem2$	$Ama2$	$Aea2$
$(mn0)$ $(\bar{m}n0)$	$A112$	$A112$	$A112$	$A112$
$(0kl)$ $(0\bar{k}l)$	$P11m$	$P11n$	$P11m$ $(a/4)$	$P11n$ $(a/4)$
$(n0m)$ $(n0\bar{m})$	$B11m$	$B11m$ $(b/4)$	$B11b$	$B11b$ $(b/4)$