

Tetragonal

6. SCANNING TABLES

 Laue class $D_{4h} - 4/mmm$

 No. 110 $I4_1cd$

$$\mathcal{G} = I4_1cd$$

 C_{4v}^{12}

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	$I4_1cd$	$[\mathbf{sd}, (s + \frac{1}{4})\mathbf{d}, (s + \frac{1}{2})\mathbf{d}, (s + \frac{3}{4})\mathbf{d}]$	$pb2$	L25
(100)	b c a	$Ic2a$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$pb2b$	L30
(010)	$-\mathbf{a}$ c b		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}]$	$pb2_1a$ ($\mathbf{a}'/4$) $pb11$	L33 L12
(110)	$(-\mathbf{a}+\mathbf{b})$ c $(\mathbf{a}+\mathbf{b})$	$Fd2d$ $[(\mathbf{a}' + \mathbf{d})/4]$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}, \frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\frac{1}{8}\mathbf{d}, \frac{5}{8}\mathbf{d}, \frac{3}{8}\mathbf{d}, \frac{7}{8}\mathbf{d}]$ $[\pm\mathbf{sd}, (\pm s + \frac{1}{4})\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}, (\pm s + \frac{3}{4})\mathbf{d}]$	$c121$ $c121$ ($\mathbf{a}'/4$) $\widehat{p}11a$ ($\mathbf{a}'/4$) $\widehat{p}11b$ ($\mathbf{a}'/4$)	L10 L10 L05 L05
($1\bar{1}0$)	$(\mathbf{a}+\mathbf{b})$ c $(\mathbf{a}-\mathbf{b})$		$Fd2d$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}, \frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\frac{1}{8}\mathbf{d}, \frac{5}{8}\mathbf{d}, \frac{3}{8}\mathbf{d}, \frac{7}{8}\mathbf{d}]$ $[\pm\mathbf{sd}, (\pm s + \frac{1}{4})\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}, (\pm s + \frac{3}{4})\mathbf{d}]$	$c121$ $c121$ ($\mathbf{a}'/4$) $\widehat{p}11b$ $\widehat{p}11a$ $p1$

Geometric classes $D_{2d} - \bar{4}2m$ and $\bar{4}m2$

 No. 111 $P\bar{4}2m$

$$\mathcal{G} = P\bar{4}2m$$

 D_{2d}^1

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	$P\bar{4}2m$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$ $[\mathbf{sd}, -\mathbf{sd}]$	$p\bar{4}2m$ $\widehat{c}mm2$	L57 L26
(100)	b c a	$P222$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$	$p222$	L19
(010)	$-\mathbf{a}$ c b		$[\mathbf{sd}, -\mathbf{sd}]$	$p112$	L03
(110)	$(-\mathbf{a}+\mathbf{b})$ c $(\mathbf{a}+\mathbf{b})$	$Bm2m$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$pm2m$	L27
($1\bar{1}0$)	$(\mathbf{a}+\mathbf{b})$ c $(\mathbf{a}-\mathbf{b})$		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$ $[\pm\mathbf{sd}, (\pm s + \frac{1}{2})\mathbf{d}]$	$pm2a$ ($\mathbf{a}'/4$) $pm11$	L31 L11

Arithmetic class $4/mmmP$ (cont.)

Serial No.	135	136	137		138	
Group type	D_{4h}^{13}	D_{4h}^{14}	D_{4h}^{15}		D_{4h}^{16}	
Group	$P4_2/mbc$	$P4_2/mmm$	$P4_2/nmc$		$P4_2/ncm$	
			Origin 1	Origin 2	Origin 1	Origin 2
$(mn0)$	$P112/m$	$P112/m$	$P112/n$	$P112/n$	$P112/n$	$P112/n$
$(\bar{m}0)$					$(\mathbf{a} + \mathbf{b} + \mathbf{c})/4$	
$(\bar{m}\bar{n}0)$						
$(nm0)$						
$(0mn)$	$P112_1/a$	$P112_1/n$	$P112_1/m$	$P112_1/m$	$P112_1/b$	$P112_1/b$
$(0\bar{m}\bar{n})$			$(\mathbf{a} + \mathbf{b} + \mathbf{c})/4$		$(\mathbf{a} + \mathbf{b} + \mathbf{c})/4$	
$(m0n)$	$P112_1/b$				$P112_1/a$	$P112_1/a$
$(m0\bar{n})$					$(\mathbf{a} + \mathbf{b} + \mathbf{c})/4$	
(hhl)	$B112/b$	$B112/m$	$B112/b$	$B112/b$	$B112/m$	$B112/m$
$(\bar{h}\bar{h}l)$	$(\mathbf{a}/2 \text{ or } \mathbf{b}/2)$		$(\mathbf{a} - \mathbf{b} + \mathbf{c})/4$		$(\mathbf{a} - \mathbf{b} + \mathbf{c})/4$	
$(h\bar{h}l)$			$B112/b$	$B112/b$	$B112/m$	$B112/m$
$(\bar{h}hl)$			$(\mathbf{a} + \mathbf{b} + \mathbf{c})/4$	$(\mathbf{a}/2 \text{ or } \mathbf{b}/2)$	$(\mathbf{a} + \mathbf{b} + \mathbf{c})/4$	$(\mathbf{a}/2 \text{ or } \mathbf{b}/2)$

Centring type I

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}
$(\bar{m}0)$	\mathbf{c}	$m\mathbf{a} + n\mathbf{b}$	$-q\mathbf{a} + p\mathbf{b}$			
$(\bar{m}\bar{n}0)$	\mathbf{c}	$n\mathbf{a} + m\mathbf{b}$	$-p\mathbf{a} + q\mathbf{b}$			
$(nm0)$	\mathbf{c}	$m\mathbf{a} - n\mathbf{b}$	$q\mathbf{a} + p\mathbf{b}$			
$(0mn)$	\mathbf{a}	$n\mathbf{b} - m\mathbf{c}$	$p\mathbf{b} + q\mathbf{c}$	\mathbf{b}	\mathbf{c}	\mathbf{a}
$(0\bar{m}\bar{n})$	\mathbf{a}	$n\mathbf{b} + m\mathbf{c}$	$-p\mathbf{b} + q\mathbf{c}$			
$(m0n)$	\mathbf{b}	$m\mathbf{c} - n\mathbf{a}$	$q\mathbf{c} + p\mathbf{a}$	\mathbf{c}	\mathbf{a}	\mathbf{b}
$(m0\bar{n})$	\mathbf{b}	$m\mathbf{c} + n\mathbf{a}$	$-q\mathbf{c} + p\mathbf{a}$			
(hhl)	$\mathbf{a} - \mathbf{b}$	$n\hat{\mathbf{a}} - m\mathbf{c}$	$p\hat{\mathbf{a}} + q\mathbf{c}$	$(\mathbf{a} + \mathbf{b} + \mathbf{c})/2$	\mathbf{c}	$\mathbf{a} - \mathbf{b}$
$(\bar{h}\bar{h}l)$	$\mathbf{a} - \mathbf{b}$	$n\hat{\mathbf{a}} + m\mathbf{c}$	$-p\hat{\mathbf{a}} + q\mathbf{c}$			
$(h\bar{h}l)$	$\mathbf{a} + \mathbf{b}$	$n\hat{\mathbf{a}} - m\mathbf{c}$	$p\hat{\mathbf{a}} + q\mathbf{c}$	$(\mathbf{b} - \mathbf{a} + \mathbf{c})/2$	\mathbf{c}	$\mathbf{a} + \mathbf{b}$
$(\bar{h}hl)$	$\mathbf{a} + \mathbf{b}$	$n\hat{\mathbf{a}} + m\mathbf{c}$	$-p\hat{\mathbf{a}} + q\mathbf{c}$			

$l \text{ odd} \Rightarrow n = 2l, m = 2h + l; l \text{ even} \Rightarrow n = l, m = h + l/2$

Arithmetic classes $422I$ and $4mmI$

Serial No.	97	98	107	108	109	110
Group type	D_4^9	D_4^{10}	C_{4v}^9	C_{4v}^{10}	C_{4v}^{11}	C_{4v}^{12}
Group	$I422$	$I4_122$	$I4mm$	$I4cm$	$I4_1md$	$I4_1cd$
$(mn0)$	$I112$	$I112$	$I112$	$I112$	$I112$	$I112$
$(\bar{m}0)$						
$(\bar{m}\bar{n}0)$						
$(nm0)$						
$(0mn)$	$I112$	$I112$	$I11m$	$I11b$	$I11m$	$I11b$
$(0\bar{m}\bar{n})$		$(\mathbf{b}/4 + \mathbf{c}/8)$				
$(m0n)$		$I112$		$I11a$		$I11a$
$(m0\bar{n})$		$(\mathbf{a}/4 + 3\mathbf{c}/8)$				
(hhl)	$A112$	$A112$	$A11m$	$A11m$	$A11n$	$A11n$
$(\bar{h}\bar{h}l)$				$(\mathbf{a}/2 \text{ or } \mathbf{b}/2)$	$(\mathbf{a} - \mathbf{b})/8$	$3(\mathbf{a} - \mathbf{b})/8$
$(h\bar{h}l)$					$A11n$	$A11n$
$(\bar{h}hl)$					$3(\mathbf{a} + \mathbf{b})/8$	$(\mathbf{a} + \mathbf{b})/8$