Tetragonal   6. SCANNING TABLES   Laue class $D_{4h} - 4/mmm$

No. 105 $P4_2mc$ C_{4v}^7

$$\mathcal{G} = P4_2mc$$

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)	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$	$P4_2mc$	$[s\mathbf{d}, (s+\frac{1}{2})\mathbf{d}]$	$pmm2$	L23
(100)	$\mathbf{b}$	$\mathbf{c}$	$\mathbf{a}$	$Pm2m$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$	$pm2m$	L27
(010)	$-\mathbf{a}$	$\mathbf{c}$	$\mathbf{b}$		$[s\mathbf{d}, -s\mathbf{d}]$	$pm11$	L11
(110)	$(-\mathbf{a}+\mathbf{b})$	$\mathbf{c}$	$(\mathbf{a}+\mathbf{b})$	$Bb2b$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$pb2b$	L30
($1\bar{1}0$)	$(\mathbf{a}+\mathbf{b})$	$\mathbf{c}$	$(\mathbf{a}-\mathbf{b})$		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$pb2n\ (\mathbf{a}'/4)$	L34
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$pb11$	L12

No. 106 $P4_2bc$ C_{4v}^8

$$\mathcal{G} = P4_2bc$$

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)	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$	$P4_2bc$	$[s\mathbf{d}, (s+\frac{1}{2})\mathbf{d}]$	$pba2$	L25
(100)	$\mathbf{b}$	$\mathbf{c}$	$\mathbf{a}$	$Pc2a$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p121$	L08
(010)	$-\mathbf{a}$	$\mathbf{c}$	$\mathbf{b}$		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p11a$	L05
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$p1$	L01
(110)	$(-\mathbf{a}+\mathbf{b})$	$\mathbf{c}$	$(\mathbf{a}+\mathbf{b})$	$Bb2b$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$pb2n$	L34
($1\bar{1}0$)	$(\mathbf{a}+\mathbf{b})$	$\mathbf{c}$	$(\mathbf{a}-\mathbf{b})$	$[(\mathbf{a}'+\mathbf{d})/4]$	$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$pb2b\ (\mathbf{a}'/4)$	L30
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$pb11\ (\mathbf{a}'/4)$	L12

No. 107 $I4mm$ C_{4v}^9

$$\mathcal{G} = I4mm$$

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)	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$	$I4mm$	$[s\mathbf{d}, (s+\frac{1}{2})\mathbf{d}]$	$p4mm$	L55
(100)	$\mathbf{b}$	$\mathbf{c}$	$\mathbf{a}$	$Im2m$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$pm2m$	L27
(010)	$-\mathbf{a}$	$\mathbf{c}$	$\mathbf{b}$		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$pm2_1n$	L32
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$pm11$	L11
(110)	$(-\mathbf{a}+\mathbf{b})$	$\mathbf{c}$	$(\mathbf{a}+\mathbf{b})$	$Fm2m$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$cm2m$	L35
($1\bar{1}0$)	$(\mathbf{a}+\mathbf{b})$	$\mathbf{c}$	$(\mathbf{a}-\mathbf{b})$		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$cm2e\ (\mathbf{a}'/4)$	L36
					$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	$cm11$	L13

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	$P4_2/mbc$	$P4_2/mnm$	$P4_2/nmc$		$P4_2/ncm$	
			Origin 1	Origin 2	Origin 1	Origin 2
$(mn0)$	$P112/m$	$P112/m$	$P112/n$	$P112/n$	$P112/n$	$P112/n$
$(\bar{n}m0)$					$(\mathbf{a}+\mathbf{b}+\mathbf{c})/4$	
$(\bar{m}n0)$						
$(nm0)$						
$(0mn)$	$P112_1/a$	$P112_1/n$	$P112_1/m$	$P112_1/m$	$P112_1/b$	$P112_1/b$
$(0\bar{m}n)$			$(\mathbf{a}+\mathbf{b}+\mathbf{c})/4$		$(\mathbf{a}+\mathbf{b}+\mathbf{c})/4$	
$(m0n)$	$P112_1/b$				$P112_1/a$	$P112_1/a$
$(m0\bar{n})$					$(\mathbf{a}+\mathbf{b}+\mathbf{c})/4$	$(\mathbf{a}+\mathbf{b}+\mathbf{c})/4$
(hhl)	$B112/b$	$B112/m$	$B112/b$	$B112/b$	$B112/m$	$B112/m$
$(\bar{h}hl)$	$(\mathbf{a}/2$ or $\mathbf{b}/2)$		$(\mathbf{a}-\mathbf{b}+\mathbf{c})/4$		$(\mathbf{a}-\mathbf{b}+\mathbf{c})/4$	
$(h\bar{h}l)$			$B112/b$	$B112/b$	$B112/m$	$B112/m$
$(\bar{h}hl)$			$(\mathbf{a}+\mathbf{b}+\mathbf{c})/4$	$(\mathbf{a}/2$ or $\mathbf{b}/2)$	$(\mathbf{a}+\mathbf{b}+\mathbf{c})/4$	$(\mathbf{a}/2$ or $\mathbf{b}/2)$

Centring type *I*

Orientation orbit (hkl)	Conventional basis of the scanning group			Auxiliary basis of the scanning group		
	$\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	$\widehat{\mathbf{a}}$	$\widehat{\mathbf{b}}$	$\widehat{\mathbf{c}}$
$(mn0)$	$\mathbf{c}$	$n\mathbf{a}-m\mathbf{b}$	$p\mathbf{a}+q\mathbf{b}$	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$
$(\bar{n}m0)$	$\mathbf{c}$	$m\mathbf{a}+n\mathbf{b}$	$-q\mathbf{a}+p\mathbf{b}$			
$(\bar{m}n0)$	$\mathbf{c}$	$n\mathbf{a}+m\mathbf{b}$	$-p\mathbf{a}+q\mathbf{b}$			
$(nm0)$	$\mathbf{c}$	$m\mathbf{a}-n\mathbf{b}$	$q\mathbf{a}+p\mathbf{b}$			
$(0mn)$	$\mathbf{a}$	$n\mathbf{b}-m\mathbf{c}$	$p\mathbf{b}+q\mathbf{c}$	$\mathbf{b}$	$\mathbf{c}$	$\mathbf{a}$
$(0\bar{m}n)$	$\mathbf{a}$	$n\mathbf{b}+m\mathbf{c}$	$-p\mathbf{b}+q\mathbf{c}$			
$(m0n)$	$\mathbf{b}$	$m\mathbf{c}-n\mathbf{a}$	$q\mathbf{c}+p\mathbf{a}$	$\mathbf{c}$	$\mathbf{a}$	$\mathbf{b}$
$(m0\bar{n})$	$\mathbf{b}$	$m\mathbf{c}+n\mathbf{a}$	$-q\mathbf{c}+p\mathbf{a}$			
(hhl)	$\mathbf{a}-\mathbf{b}$	$n\widehat{\mathbf{a}}-m\mathbf{c}$	$p\widehat{\mathbf{a}}+q\mathbf{c}$	$(\mathbf{a}+\mathbf{b}+\mathbf{c})/2$	$\mathbf{c}$	$\mathbf{a}-\mathbf{b}$
$(\bar{h}hl)$	$\mathbf{a}-\mathbf{b}$	$n\widehat{\mathbf{a}}+m\mathbf{c}$	$-p\widehat{\mathbf{a}}+q\mathbf{c}$			
$(h\bar{h}l)$	$\mathbf{a}+\mathbf{b}$	$n\widehat{\mathbf{a}}-m\mathbf{c}$	$p\widehat{\mathbf{a}}+q\mathbf{c}$	$(\mathbf{b}-\mathbf{a}+\mathbf{c})/2$	$\mathbf{c}$	$\mathbf{a}+\mathbf{b}$
$(\bar{h}hl)$	$\mathbf{a}+\mathbf{b}$	$n\widehat{\mathbf{a}}+m\mathbf{c}$	$-p\widehat{\mathbf{a}}+q\mathbf{c}$			
l odd $\Rightarrow n=2l,\ m=2h+l$; l 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	$I422$	$I4_122$	$I4mm$	$I4cm$	$I4_1md$	$I4_1cd$
$(mn0)$	$I112$	$I112$	$I112$	$I112$	$I112$	$I112$
$(\bar{n}m0)$						
$(\bar{m}n0)$						
$(nm0)$						
$(0mn)$	$I112$	$I112$	$I11m$	$I11b$	$I11m$	$I11b$
$(0\bar{m}n)$		$(\mathbf{b}/4+\mathbf{c}/8)$				
$(m0n)$		$I112$		$I11a$		$I11a$
$(m0\bar{n})$		$(\mathbf{a}/4+3\mathbf{c}/8)$				
(hhl)	$A112$	$A112$	$A11m$	$A11m$	$A11n$	$A11n$
$(\bar{h}hl)$				$(\mathbf{a}/2$ or $\mathbf{b}/2)$	$(\mathbf{a}-\mathbf{b})/8$	$3(\mathbf{a}-\mathbf{b})/8$
$(h\bar{h}l)$					$A11n$	$A11n$
$(\bar{h}hl)$					$3(\mathbf{a}+\mathbf{b})/8$	$(\mathbf{a}+\mathbf{b})/8$