Cubic   6. SCANNING TABLES   Laue class $O_h - m\bar{3}m$

Centring type *F*

Orientation orbit (hkl)	Conventional basis of the scanning group $\mathbf{a}'$ $\mathbf{b}'$ $\mathbf{d}$			Auxiliary basis of the scanning group $\hat{\mathbf{a}}$ $\hat{\mathbf{b}}$ $\hat{\mathbf{c}}$		
($hk0$)	$\mathbf{c}$	$n\hat{\mathbf{a}} - m\hat{\mathbf{b}}$	$p\hat{\mathbf{a}} + q\hat{\mathbf{b}}$	$(\mathbf{a} - \mathbf{b})/2$	$(\mathbf{a} + \mathbf{b})/2$	$\mathbf{c}$
($\bar{h}k0$)	$\mathbf{c}$	$n\hat{\mathbf{a}} + m\hat{\mathbf{b}}$	$-p\hat{\mathbf{a}} + q\hat{\mathbf{b}}$			
($0hk$)	$\mathbf{a}$	$n\hat{\mathbf{a}} - m\hat{\mathbf{b}}$	$p\hat{\mathbf{a}} + q\hat{\mathbf{b}}$	$(\mathbf{b} - \mathbf{c})/2$	$(\mathbf{b} + \mathbf{c})/2$	$\mathbf{a}$
($0\bar{h}k$)	$\mathbf{a}$	$n\hat{\mathbf{a}} + m\hat{\mathbf{b}}$	$-p\hat{\mathbf{a}} + q\hat{\mathbf{b}}$			
($k0h$)	$\mathbf{b}$	$n\hat{\mathbf{a}} - m\hat{\mathbf{b}}$	$p\hat{\mathbf{a}} + q\hat{\mathbf{b}}$	$(\mathbf{c} - \mathbf{a})/2$	$(\mathbf{c} + \mathbf{a})/2$	$\mathbf{b}$
($k0\bar{h}$)	$\mathbf{b}$	$n\hat{\mathbf{a}} + m\hat{\mathbf{b}}$	$-p\hat{\mathbf{a}} + q\hat{\mathbf{b}}$			

h even, k odd or h odd, k even $\Rightarrow n = h + k, m = h - k$
h, k odd $\Rightarrow n = (h + k)/2, m = (h - k)/2$

Arithmetic classes $23F$ and $m\bar{3}F$

Serial No.	196	202	203	
Group type	T^2	T_h^3	T_h^4	
Group	$F23$	$Fm\bar{3}$	$Fd\bar{3}$	
			Origin 1	Origin 2
($hk0$)	$I112$	$I112/m$	$I112/b$	$I112/b$
($\bar{h}k0$)			$(\mathbf{a} + \mathbf{b} + \mathbf{c})/8$	
($0hk$)				
($0\bar{h}k$)				
($k0h$)				
($k0\bar{h}$)				

Laue class $O_h - m\bar{3}m$

Geometric class $O - 432$

No. 207   *P*432 O^1

$$\mathcal{G} = P432$$

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)	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$	$P422$	$0\mathbf{d}, \frac{1}{2}\mathbf{d}$	$p422$	L53
(100)	$\mathbf{b}$	$\mathbf{c}$	$\mathbf{a}$		$[s\mathbf{d}, -s\mathbf{d}]$	$p4$	L49
(010)	$\mathbf{c}$	$\mathbf{a}$	$\mathbf{b}$				
(110)	$\mathbf{c}$	$\mathbf{a} - \mathbf{b}$	$\mathbf{a} + \mathbf{b}$	$A222$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p222$	L19
($1\bar{1}0$)	$\mathbf{c}$	$\mathbf{a} + \mathbf{b}$	$\mathbf{b} - \mathbf{a}$		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p22_12$	L20
(011)	$\mathbf{a}$	$\mathbf{b} - \mathbf{c}$	$\mathbf{b} + \mathbf{c}$		$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p112$	L03
($01\bar{1}$)	$\mathbf{a}$	$\mathbf{b} + \mathbf{c}$	$\mathbf{c} - \mathbf{b}$				
(101)	$\mathbf{b}$	$\mathbf{c} - \mathbf{a}$	$\mathbf{c} + \mathbf{a}$				
($\bar{1}01$)	$\mathbf{b}$	$\mathbf{c} + \mathbf{a}$	$\mathbf{a} - \mathbf{c}$				
(111)	$\mathbf{a} - \mathbf{b}$	$\mathbf{b} - \mathbf{c}$	τ	$R32$	$[0\mathbf{d}, \quad [\frac{1}{2}\mathbf{d},$	$p321$	L68
($\bar{1}\bar{1}1$)	$\mathbf{b} - \mathbf{a}$	$-\mathbf{b} - \mathbf{c}$	τ_3		$\frac{1}{3}\mathbf{d}, \parallel \frac{5}{6}\mathbf{d},$	$p321 [(2\mathbf{a}' + \mathbf{b}')/3]$	L68
($1\bar{1}\bar{1}$)	$\mathbf{a} + \mathbf{b}$	$\mathbf{c} - \mathbf{b}$	τ_1		$\frac{2}{3}\mathbf{d}] \quad \frac{1}{6}\mathbf{d}]$	$p321 [(\mathbf{a}' + 2\mathbf{b}')/3]$	L68
($\bar{1}1\bar{1}$)	$-\mathbf{a} - \mathbf{b}$	$\mathbf{b} + \mathbf{c}$	τ_2		$[\pm s\mathbf{d}, (\pm s + \frac{1}{3})\mathbf{d}, (\pm s + \frac{2}{3})\mathbf{d}]$	$p3$	L65

Auxiliary tables for Laue class $O_h - m\bar{3}m$

Centring type P

Orientation orbit (hkl)	Conventional basis of the scanning group $\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	Auxiliary basis of the scanning group $\hat{\mathbf{a}}$	$\hat{\mathbf{b}}$	$\hat{\mathbf{c}}$
$(mn0)$	$\mathbf{c}$	$n\mathbf{a} - m\mathbf{b}$	$p\mathbf{a} + q\mathbf{b}$	$\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}$
$(\overline{m}n0)$	$\mathbf{c}$	$n\mathbf{a} + m\mathbf{b}$	$-p\mathbf{a} + q\mathbf{b}$			
$(nm0)$	$\mathbf{c}$	$m\mathbf{a} - n\mathbf{b}$	$q\mathbf{a} + p\mathbf{b}$			
$(\overline{n}m0)$	$\mathbf{c}$	$m\mathbf{a} + n\mathbf{b}$	$-q\mathbf{a} + p\mathbf{b}$			
$(0mn)$	$\mathbf{a}$	$n\mathbf{b} - m\mathbf{c}$	$p\mathbf{b} + q\mathbf{c}$	$\mathbf{b}$	$\mathbf{c}$	$\mathbf{a}$
$(0\overline{m}n)$	$\mathbf{a}$	$n\mathbf{b} + m\mathbf{c}$	$-p\mathbf{b} + q\mathbf{c}$			
$(0nm)$	$\mathbf{a}$	$m\mathbf{b} - n\mathbf{c}$	$q\mathbf{b} + p\mathbf{c}$			
$(0\overline{n}m)$	$\mathbf{a}$	$m\mathbf{b} + n\mathbf{c}$	$-q\mathbf{b} + p\mathbf{c}$			
$(n0m)$	$\mathbf{b}$	$n\mathbf{c} - m\mathbf{a}$	$p\mathbf{c} + q\mathbf{a}$	$\mathbf{c}$	$\mathbf{a}$	$\mathbf{b}$
$(n0\overline{m})$	$\mathbf{b}$	$n\mathbf{c} + m\mathbf{a}$	$-p\mathbf{c} + q\mathbf{a}$			
$(m0n)$	$\mathbf{b}$	$m\mathbf{c} - n\mathbf{a}$	$q\mathbf{c} + p\mathbf{a}$			
$(m0\overline{n})$	$\mathbf{b}$	$m\mathbf{c} + n\mathbf{a}$	$-q\mathbf{c} + p\mathbf{a}$			
(hhl)	$\mathbf{a} - \mathbf{b}$	$n(\mathbf{a}+\mathbf{b}) - m\mathbf{c}$	$p(\mathbf{a}+\mathbf{b}) + q\mathbf{c}$	$\mathbf{a}+\mathbf{b}$	$\mathbf{c}$	$\mathbf{a}-\mathbf{b}$
$(\overline{h}hl)$	$\mathbf{a} - \mathbf{b}$	$n(\mathbf{a}+\mathbf{b}) + m\mathbf{c}$	$-p(\mathbf{a}+\mathbf{b}) + q\mathbf{c}$			
$(h\overline{h}l)$	$\mathbf{a} + \mathbf{b}$	$n(\mathbf{b}-\mathbf{a}) - m\mathbf{c}$	$p(\mathbf{b}-\mathbf{a}) + q\mathbf{c}$	$\mathbf{b}-\mathbf{a}$	$\mathbf{c}$	$\mathbf{a}+\mathbf{b}$
$(\overline{h}hl)$	$\mathbf{a} + \mathbf{b}$	$n(\mathbf{b}-\mathbf{a}) + m\mathbf{c}$	$-p(\mathbf{b}-\mathbf{a}) + q\mathbf{c}$			
(lhh)	$\mathbf{b} - \mathbf{c}$	$n(\mathbf{b}+\mathbf{c}) - m\mathbf{a}$	$p(\mathbf{b}+\mathbf{c}) + q\mathbf{a}$	$\mathbf{b}+\mathbf{c}$	$\mathbf{a}$	$\mathbf{b}-\mathbf{c}$
$(l\overline{h}h)$	$\mathbf{b} - \mathbf{c}$	$n(\mathbf{b}+\mathbf{c}) + m\mathbf{a}$	$-p(\mathbf{b}+\mathbf{c}) + q\mathbf{a}$			
$(lh\overline{h})$	$\mathbf{b} + \mathbf{c}$	$n(\mathbf{c}-\mathbf{b}) - m\mathbf{a}$	$p(\mathbf{c}-\mathbf{b}) + q\mathbf{a}$	$\mathbf{c}-\mathbf{b}$	$\mathbf{a}$	$\mathbf{b}+\mathbf{c}$
$(\overline{l}hh)$	$\mathbf{b} + \mathbf{c}$	$n(\mathbf{c}-\mathbf{b}) + m\mathbf{a}$	$-p(\mathbf{c}-\mathbf{b}) + q\mathbf{a}$			
(hlh)	$\mathbf{c} - \mathbf{a}$	$n(\mathbf{c}+\mathbf{a}) - m\mathbf{b}$	$p(\mathbf{c}+\mathbf{a}) + q\mathbf{b}$	$\mathbf{c}+\mathbf{a}$	$\mathbf{b}$	$\mathbf{c}-\mathbf{a}$
$(hl\overline{h})$	$\mathbf{c} - \mathbf{a}$	$n(\mathbf{c}+\mathbf{a}) + m\mathbf{b}$	$-p(\mathbf{c}+\mathbf{a}) + q\mathbf{b}$			
$(\overline{h}lh)$	$\mathbf{c} + \mathbf{a}$	$n(\mathbf{a}-\mathbf{c}) - m\mathbf{b}$	$p(\mathbf{a}-\mathbf{c}) + q\mathbf{b}$	$\mathbf{a}-\mathbf{c}$	$\mathbf{b}$	$\mathbf{c}+\mathbf{a}$
$(hl\overline{h})$	$\mathbf{c} + \mathbf{a}$	$n(\mathbf{a}-\mathbf{c}) + m\mathbf{b}$	$-p(\mathbf{a}-\mathbf{c}) + q\mathbf{b}$			
l odd $\Rightarrow n = l, m = 2h$; l even $\Rightarrow n = l/2, m = h$						

Arithmetic classes $432P$ and $\overline{4}3mP$

Serial No.	207	208	212	213	215	218
Group type	O^1	O^2	O^6	O^7	T_d^1	T_d^4
Group	$P432$	$P4_232$	$P4_332$	$P4_132$	$P\overline{4}3m$	$P\overline{4}3n$
$(mn0)$	$P112$	$P112$	$P112_1$	$P112_1$	$P112$	$P112$
$(\overline{m}n0)$			$(\mathbf{a}/4)$	$(\mathbf{a}/4)$		
$(nm0)$						
$(\overline{n}m0)$						
$(0mn)$			$P112_1$	$P112_1$		
$(0\overline{m}n)$			$(\mathbf{b}/4)$	$(\mathbf{b}/4)$		
$(0nm)$						
$(0\overline{n}m)$						
$(n0m)$			$P112_1$	$P112_1$		
$(n0\overline{m})$			$(\mathbf{c}/4)$	$(\mathbf{c}/4)$		
$(m0n)$						
$(m0\overline{n})$						
(hhl)	$A112$	$A112$	$A112$	$A112$	$A11m$	$A11a$
$(\overline{h}hl)$		$(\mathbf{a}+\mathbf{c})/4$	$(\mathbf{a}+\mathbf{c})/8$	$3(\mathbf{a}+\mathbf{c})/8$		
$(h\overline{h}l)$			$A112$	$A112$		
$(\overline{h}hl)$			$3(\mathbf{b}+\mathbf{c})/8$	$(\mathbf{b}+\mathbf{c})/8$		
(lhh)		$A112$	$A112$	$A112$		
$(l\overline{h}\overline{h})$		$(\mathbf{b}+\mathbf{a})/4$	$(\mathbf{b}+\mathbf{a})/8$	$3(\mathbf{b}+\mathbf{a})/8$		
$(lh\overline{h})$			$A112$	$A112$		
$(l\overline{h}h)$			$3(\mathbf{c}+\mathbf{a})/8$	$(\mathbf{c}+\mathbf{a})/8$		
(hlh)		$A112$	$A112$	$A112$		
$(\overline{h}l\overline{h})$		$(\mathbf{c}+\mathbf{b})/4$	$(\mathbf{c}+\mathbf{b})/8$	$3(\mathbf{c}+\mathbf{b})/8$		
$(\overline{h}lh)$			$A112$	$A112$		
$(hl\overline{h})$			$3(\mathbf{a}+\mathbf{b})/8$	$(\mathbf{a}+\mathbf{b})/8$		