

2. RECIPROCAL SPACE IN CRYSTAL-STRUCTURE DETERMINATION

Table 2.5.3.9. Dynamical extinction lines appearing in ZOLZ reflections for all crystal space groups except Nos. 1 and 2

Point groups 2, *m*, 2/*m* (second setting, unique axis *b*)

Space group	Incident-beam direction		
	[<i>h0l</i>]		
3 <i>P2</i>			
4 <i>P2</i> ₁	0 <i>k</i> 0 2 ₁	<i>A</i> ₂	<i>B</i> ₂ <i>B</i> ₃
5 <i>C2</i>			
6 <i>Pm</i>			
7 <i>Pc</i>	<i>h0l</i> ₀ <i>c</i>	<i>A</i> ₂ <i>A</i> ₃	<i>B</i> ₂
8 <i>Cm</i>			
9 <i>Cc</i>	<i>h_c0l</i> ₀ <i>c</i>	<i>A</i> ₂ <i>A</i> ₃	<i>B</i> ₂
10 <i>P2/m</i>			
11 <i>P2</i> ₁ / <i>m</i>	0 <i>k</i> 0 2 ₁	<i>A</i> ₂	<i>B</i> ₂ <i>B</i> ₃
12 <i>C2/m</i>			
13 <i>P2/c</i>	<i>h0l</i> ₀ <i>c</i>	<i>A</i> ₂ <i>A</i> ₃	<i>B</i> ₂
14 <i>P2</i> ₁ / <i>c</i>	0 <i>k</i> 0 2 ₁	<i>A</i> ₂	<i>B</i> ₂ <i>B</i> ₃
	<i>h0l</i> ₀ <i>c</i>	<i>A</i> ₂ <i>A</i> ₃	<i>B</i> ₂
15 <i>C2/c</i>	<i>h_c0l</i> ₀ <i>c</i>	<i>A</i> ₂ <i>A</i> ₃	<i>B</i> ₂

Point group 222

Space group	Incident-beam direction					
	[100]	[010]	[001]	[<i>hk</i> 0]	[0 <i>kl</i>]	[<i>h0l</i>]
16 <i>P222</i>						
17 <i>P222</i> ₁	00 <i>l</i> 2 ₁	00 <i>l</i> 2 ₁		00 <i>l</i> 2 ₁		
18 <i>P2</i> ₁ 2 ₁ 2	0 <i>k</i> 0 2 ₁₂	<i>h</i> 00 2 ₁₁	<i>h</i> 00 2 ₁₁ 0 <i>k</i> 0 2 ₁₂		<i>h</i> 00 2 ₁₁	0 <i>k</i> 0 2 ₁₂
19 <i>P2</i> ₁ 2 ₁ 2 ₁	0 <i>k</i> 0 2 ₁₂ 00 <i>l</i> 2 ₁₃	<i>h</i> 00 2 ₁₁ 00 <i>l</i> 2 ₁₃	<i>h</i> 00 2 ₁₁ 0 <i>k</i> 0 2 ₁₂	00 <i>l</i> 2 ₁₃	<i>h</i> 00 2 ₁₁	0 <i>k</i> 0 2 ₁₂
20 <i>C222</i> ₁	00 <i>l</i> 2 ₁	00 <i>l</i> 2 ₁		00 <i>l</i> 2 ₁		
21 <i>C222</i>						
22 <i>F222</i>						
23 <i>I222</i>						
24 <i>I2</i> ₁ 2 ₁ 2 ₁						

Point group *mm*2

Space group	Incident-beam direction					
	[100]	[010]	[001]	[<i>hk</i> 0]	[0 <i>kl</i>]	[<i>h0l</i>]
25 <i>Pmm</i> 2						
26 <i>Pmc</i> 2 ₁	00 <i>l</i> <i>c</i> , 2 ₁	00 <i>l</i> 2 ₁		00 <i>l</i> 2 ₁		<i>h0l</i> ₀ <i>c</i>
27 <i>Pcc</i> 2	00 <i>l</i> <i>c</i> ₂	00 <i>l</i> <i>c</i> ₁			0 <i>kl</i> ₀ <i>c</i> ₁	<i>h0l</i> ₀ <i>c</i> ₂
28 <i>Pma</i> 2			<i>h</i> 00 <i>a</i>	<i>A</i> ₂ <i>A</i> ₃		<i>h₀0l</i> <i>a</i>
29 <i>Pca</i> 2 ₁	00 <i>l</i> 2 ₁	00 <i>l</i> <i>c</i> , 2 ₁	<i>h</i> 00 <i>a</i>	<i>A</i> ₂ <i>A</i> ₃	00 <i>l</i> 2 ₁	0 <i>kl</i> ₀ <i>c</i>

2.5. ELECTRON DIFFRACTION AND ELECTRON MICROSCOPY IN STRUCTURE DETERMINATION

Table 2.5.3.9 (cont.)

Space group	Incident-beam direction					
	[100]	[010]	[001]	[hk0]	[0kl]	[h0l]
30 <i>Pnc2</i>	00l c A ₃	00l n A ₃	0k0 n A ₂ B ₂ A ₃		0kl: k + l = 2n + 1 n A ₂ B ₂ A ₃	h0l _o c A ₂ B ₂ A ₃
31 <i>Pmn2₁</i>	00l n, 2 ₁ A ₂ B ₂ A ₃ B ₃	00l 2 ₁ B ₃	h00 n A ₂ B ₂ A ₃	00l 2 ₁ A ₂ B ₂ B ₃		h0l: h + l = 2n + 1 n A ₂ B ₂ A ₃
32 <i>Pba2</i>			h00 a 0k0 b A ₂ B ₂ A ₃		0k _o l b A ₂ B ₂ A ₃	h _o 0l a A ₂ B ₂ A ₃
33 <i>Pna2₁</i>	00l 2 ₁ B ₃	00l n, 2 ₁ A ₂ B ₂ A ₃ B ₃	h00 a 0k0 n A ₂ B ₂ A ₃	00l 2 ₁ A ₂ B ₂ B ₃	0kl: k + l = 2n + 1 n A ₂ B ₂ A ₃	h _o 0l a A ₂ B ₂ A ₃
34 <i>Pnn2</i>	00l n ₂ A ₃	00l n ₁ A ₃	h00 n ₂ 0k0 n ₁ A ₂ B ₂ A ₃		0kl: k + l = 2n + 1 n ₁ A ₂ B ₂ A ₃	h0l: h + l = 2n + 1 n ₂ A ₂ B ₂ A ₃
35 <i>Cmm2 ba2</i>						
36 <i>Cmc2₁ bn2₁</i>	00l c, 2 ₁ A ₂ B ₂ A ₃ B ₃	00l 2 ₁ B ₃		00l 2 ₁ A ₂ B ₂ B ₃		h _e 0l _o c A ₂ B ₂ A ₃
37 <i>Ccc2 nn2</i>	00l c ₂ A ₃	00l c ₁ A ₃			0k _e l _o c ₁ A ₂ B ₂ A ₃	h _e 0l _o c ₂ A ₂ B ₂ A ₃
38 <i>Amm2 nc2₁</i>						
39 <i>Abm2 cc2₁</i>					0k _o l _o b A ₂ B ₂ A ₃	
40 <i>Ama2 nn2₁</i>			h00 a A ₂ B ₂ A ₃			h _o 0l _e a A ₂ B ₂ A ₃
41 <i>Aba2 cn2₁</i>			h00 a A ₂ B ₂ A ₃		0k _o l _o b A ₂ B ₂ A ₃	h _o 0l _e a A ₂ B ₂ A ₃
42 <i>Fmm2</i>						
43 <i>Fdd2 dd2₁</i>	00l: l = 4n + 2 d ₂ A ₃	00l: l = 4n + 2 d ₁ A ₃	h00: h = 4n + 2 d ₂ 0k0: k = 4n + 2 d ₁ A ₂ B ₂ A ₃		0k _e l _e : k _e + l _e = 4n + 2 d ₁ A ₂ B ₂ A ₃	h _e 0l _e : h _e + l _e = 4n + 2 d ₂ A ₂ B ₂ A ₃
44 <i>Imm2 nn2₁</i>						
45 <i>Iba2 cc2₁</i>					0k _o l _o b A ₂ B ₂ A ₃	h _o 0l _o a A ₂ B ₂ A ₃
46 <i>Ima2 nc2₁</i>						h _o 0l _o a A ₂ B ₂ A ₃

Point group *mmm*

Space group	Incident-beam direction					
	[100]	[010]	[001]	[hk0]	[0kl]	[h0l]
47 <i>P2/m2/m2/m</i>						
48 <i>P2/n2/n2/n</i>	00l n ₂ 0k0 n ₃ A ₃	00l n ₁ h00 n ₃ A ₃	0k0 n ₁ h00 n ₂ A ₃	hk0: h + k = 2n + 1 n ₃ A ₂ B ₂ A ₃	0kl: k + l = 2n + 1 n ₁ A ₂ B ₂ A ₃	h0l: h + l = 2n + 1 n ₂ A ₂ B ₂ A ₃
49 <i>P2/c2/c2/m</i>	00l c ₂ A ₃	00l c ₁ A ₃			0kl _o c ₁ A ₂ B ₂ A ₃	h0l _o c ₂ A ₂ B ₂ A ₃
50 <i>P2/b2/a2/n</i>	0k0 n A ₃	h00 n A ₃	0k0 b h00 a A ₃	hk0: h + k = 2n + 1 n A ₂ B ₂ A ₃	0k _o l b A ₂ B ₂ A ₃	h _o 0l a A ₂ B ₂ A ₃
51 <i>P2₁/m2/m2/a</i>		h00 2 ₁ , a A ₂ B ₂ A ₃ B ₃	h00 2 ₁ B ₃	h _o k0 a A ₂ B ₂ A ₃	h00 2 ₁ A ₂ B ₂ B ₃	

2. RECIPROCAL SPACE IN CRYSTAL-STRUCTURE DETERMINATION

Table 2.5.3.9 (cont.)

Space group	Incident-beam direction					
	[100]	[010]	[001]	[hk0]	[0kl]	[h0l]
52 $P2_1/n2_1/n2_1/a$	00l n_2 A_3	00l n_1 A_3 h00 a	0k0 A_2 B_2 $n_1, 2_1$ A_3 B_3	h_0k0 A_2 B_2 a A_3	0kl: $k+l=$ $2n+1$ n_1 A_2 B_2 A_3	h0l: $h+l=$ $2n+1$ n_2 A_2 B_2 A_3
	0k0 2_1 B_3		h00 n_2 A_3			0k0 A_2 B_2 2_1 B_3
53 $P2_1/m2_1/n2_1/a$	00l A_2 B_2 $n, 2_1$ A_3 B_3	h00 a A_3	h00 n A_3	h_0k0 A_2 B_2 a A_3		h0l: $h+l=$ $2n+1$ n A_2 B_2 A_3
		00l 2_1 B_3		00l 2_1 A_2 B_2 B_3		
54 $P2_1/c2_1/c2_1/a$	00l c_2 A_3	00l c_1 A_3	h00 2_1 B_3	h_0k0 A_2 B_2 a A_3	0kl ₀ A_2 B_2 c_1 A_3	h0l ₀ A_2 B_2 c_2 A_3
		h00 A_2 B_2 $a, 2_1$ A_3 B_3			h00 A_2 B_2 2_1 B_3	
55 $P2_1/b2_1/a2_1/m$	0k0 2_{12} B_3	h00 2_{11} B_3	0k0 A_2 B_2 $b, 2_{12}$ A_3 B_3		0k ₀ l A_2 B_2 b A_3	h ₀ 0l A_2 B_2 a A_3
			h00 $a, 2_{11}$		h00 A_2 B_2 2_{11} B_3	0k0 A_2 B_2 2_{12} B_3
56 $P2_1/c2_1/c2_1/n$	00l c_2 A_3	00l c_1 A_3	0k0 2_{12} B_3 h00 2_{11}	hk0: $h+k=$ $2n+1$ n A_2 B_2 A_3	0kl ₀ A_2 B_2 c_1 A_3	h0l ₀ A_2 B_2 c_2 A_3
	0k0 A_2 B_2 $2_{12}, n$ A_3 B_3	h00 A_2 B_2 $2_{11}, n$ A_3 B_3			h00 A_2 B_2 2_{11} B_3	0k0 A_2 B_2 2_{12} B_3
57 $P2_1/b2_1/c2_1/m$	00l A_2 B_2 $c, 2_{12}$ A_3 B_3	00l 2_{12} B_3	0k0 A_2 B_2 $b, 2_{11}$ A_3 B_3	00l A_2 B_2 2_{12} B_3	0k ₀ l A_2 B_2 b A_3	h0l ₀ A_2 B_2 c A_3
	0k0 2_{11} B_3					0k0 A_2 B_2 2_{11} B_3
58 $P2_1/n2_1/n2_1/m$	00l n_2 A_3	00l n_1 A_3	0k0 A_2 B_2 $n_1, 2_{12}$ A_3 B_3 h00 $n_2, 2_{11}$		0kl: $k+l=$ $2n+1$ n_1 A_2 B_2 A_3	h0l: $h+l=$ $2n+1$ n_2 A_2 B_2 A_3
	0k0 2_{12} B_3	h00 2_{11} B_3			h00 A_2 B_2 2_{11} B_3	0k0 A_2 B_2 2_{12} B_3
59 $P2_1/m2_1/m2_1/n$	0k0 A_2 B_2 $n, 2_{12}$ A_3 B_3	h00 A_2 B_2 $n, 2_{11}$ A_3 B_3	0k0 2_{12} B_3 h00 2_{11}	hk0: $h+k=$ $2n+1$ n A_2 B_2 A_3	h00 A_2 B_2 2_{11} B_3	0k0 A_2 B_2 2_{12} A_3
60 $P2_1/b2_1/c2_1/n$	00l A_2 B_2 $c, 2_{12}$ A_3 B_3	h00 A_2 B_2 $n, 2_{11}$ A_3 B_3	0k0 b A_3	hk0: $h+k=$ $2n+1$ n A_2 B_2 A_3	0k ₀ l A_2 B_2 b A_3	h0l ₀ A_2 B_2 c A_3
	0k0 n A_3	00l 2_{12} B_3	h00 2_{11} B_3	00l A_2 B_2 2_{12} B_3	h00 A_2 B_2 2_{11} B_3	
61 $P2_1/b2_1/c2_1/a$	00l A_2 B_2 $c, 2_{13}$ A_3 B_3	00l 2_{13} B_3	0k0 A_2 B_2 $b, 2_{12}$ A_3 B_3	h_0k0 A_2 B_2 a A_3	0k ₀ l A_2 B_2 b A_3	h0l ₀ A_2 B_2 c A_3
	0k0 2_{12} B_3	h00 A_2 B_2 $a, 2_{11}$ A_3 B_3	h00 2_{11} B_3	00l A_2 B_2 2_{13} B_3	h00 A_2 B_2 2_{11} B_3	0k0 A_2 B_2 2_{12} B_3
62 $P2_1/n2_1/m2_1/a$	00l 2_{13} B_3 0k0 2_{12}	00l A_2 B_2 $n, 2_{13}$ A_3 B_3 h00 $a, 2_{11}$	0k0 A_2 B_2 $n, 2_{12}$ A_3 B_3	h_0k0 A_2 B_2 a A_3	0kl: $k+l=$ $2n+1$ n A_2 B_2 A_3	0k0 A_2 B_2 2_{12} B_3
			h00 2_{11} B_3	00l A_2 B_2 2_{13} B_3	h00 A_2 B_2 2_{11} B_3	
63 $C2/m2_1/c2_1/m$	00l A_2 B_2 $c, 2_1$ A_3 B_3	00l 2_1 B_3		00l A_2 B_2 2_1 B_3		h ₀ 0l ₀ A_2 B_2 c A_3
64 $C2/m2_1/c2_1/a$	00l A_2 B_2 $c, 2_1$ A_3 B_3	00l 2_1 B_3		h_0k_00 A_2 B_2 a A_3		h ₀ 0l ₀ A_2 B_2 c A_3
				00l A_2 B_2 2_1 B_3		
65 $C2/m2_1/m2_1/m$						
66 $C2/c2_1/c2_1/m$	00l c_2 A_3	00l c_1 A_3			0k ₀ l ₀ A_2 B_2 c_1 A_3	h ₀ 0l ₀ A_2 B_2 c_2 A_3
67 $C2/m2_1/m2_1/a$				h_0k_00 A_2 B_2 a A_3		

2.5. ELECTRON DIFFRACTION AND ELECTRON MICROSCOPY IN STRUCTURE DETERMINATION

Table 2.5.3.9 (cont.)

Space group	Incident-beam direction					
	[100]	[010]	[001]	[hk0]	[0kl]	[h0l]
68 $C2/c2/c2/a$	00l c_2 A_3	00l c_1 A_3		h_0k_00 a A_2 B_2 A_3	$0k_0l_0$ c_1 A_2 B_2 A_3	h_0l_0 c_2 A_2 B_2 A_3
69 $F2/m2/m2/m$						
70 $F2/d2/d2/d$	00l: $l = A_3$ $4n + 2$ d_2 0k0: $k =$ $4n + 2$ d_3	h00: $h = A_3$ $4n + 2$ d_3 00l: $l =$ $4n + 2$ d_1	0k0: $k = A_3$ $4n + 2$ d_1 h00: $h =$ $4n + 2$ d_2	h_0k_00 : $h_0 + k_0 =$ $4n + 2$ d_3 A_2 B_2 A_3	$0k_0l_0$: $k_0 + l_0 =$ $4n + 2$ d_1 A_2 B_2 A_3	h_0l_0 : $h_0 + l_0 =$ $4n + 2$ d_2 A_2 B_2 A_3
71 $I2/m2/m2/m$						
72 $I2/b2/a2/m$					$0k_0l_0$ b A_2 B_2 A_3	h_0l_0 a A_2 B_2 A_3
73 $I2_1/b2_1/c2_1/a$				h_0k_00 a A_2 B_2 A_3	$0k_0l_0$ b A_2 B_2 A_3	h_0l_0 c A_2 B_2 A_3
74 $I2_1/m2_1/m2_1/a$				h_0k_00 a A_2 B_2 A_3		

 Point groups 4, $\bar{4}$, 4/m

Space group	Incident-beam direction	
	[hk0]	[0kl]
75 $P4$		
76 $P4_1$	00l 4_1	A_2 B_2 B_3
77 $P4_2$		
78 $P4_3$	00l 4_3	A_2 B_2 B_3
79 $I4$		
80 $I4_1$		
81 $P\bar{4}$		
82 $I\bar{4}$		
83 $P4/m$		
84 $P4_2/m$		
85 $P4/n$	hk0: $h + k = 2n + 1$ n	A_2 B_2 A_3
86 $P4_2/n$	hk0: $h + k = 2n + 1$ n	A_2 B_2 A_3
87 $I4/m$		
88 $I4_1/a$	h_0k_00 a	A_2 B_2 A_3

Point group 422

Space group	Incident-beam direction	
	[hk0]	[0kl]
89 $P422$		
90 $P42_12$		$h00$ A_2 B_2 2_1 B_3
91 $P4_122$	00l A_2 B_2 4_1 B_3	
92 $P4_12_12$	00l A_2 B_2 4_1 B_3	$h00$ A_2 B_2 2_1 B_3
93 $P4_222$		
94 $P4_22_12$		$h00$ A_2 B_2 2_1 B_3
95 $P4_322$	00l A_2 B_2 4_3 B_3	
96 $P4_32_12$	00l A_2 B_2 4_3 B_3	$h00$ A_2 B_2 2_1 B_3
97 $I422$		
98 $I4_122$		

2. RECIPROCAL SPACE IN CRYSTAL-STRUCTURE DETERMINATION

Table 2.5.3.9 (cont.)

Point group $4mm$. The symbol a in the column $[h0l]$ is equivalent to the symbol b in the space groups of the first column.

Space group	Incident-beam direction				
	[100]	[001]	[110]	$[h0l]$	$[hhl]$
99 $P4mm$					
100 $P4bm$		$h00$ A_2 B_2 a_2 A_3 $0k0$ b_1		h_00l A_2 B_2 a A_3	
101 $P4_2cm$	$00l$ c_2 A_3			$h0l_0$ A_2 B_2 c A_3	
102 $P4_2nm$	$00l$ n_2 A_3	$h00$ A_2 B_2 n_2 A_3 $0k0$ n_1		$h0l: h + l = 2n + 1$ A_2 B_2 n A_3	
103 $P4cc$	$00l$ c_{12} A_3		$00l$ c_2 A_3	$h0l_0$ A_2 B_2 c_1 A_3	hhl_0 A_2 B_2 c_2 A_3
104 $P4nc$	$00l$ n_2 A_3	$h00$ A_2 B_2 n_2 A_3 $0k0$ n_1	$00l$ c A_3	$h0l: h + l = 2n + 1$ A_2 B_2 n A_3	hhl_0 A_2 B_2 c A_3
105 $P4_2mc$			$00l$ c A_3		hhl_0 A_2 B_2 c A_3
106 $P4_2bc$		$h00$ A_2 B_2 a_2 A_3 $0k0$ b_1	$00l$ c A_3	h_00l A_2 B_2 a A_3	hhl_0 A_2 B_2 c A_3
107 $I4mm$					
108 $I4cm$				h_00l_0 A_2 B_2 c A_3	
109 $I4_1md$		$hh0, \bar{h}h0$ A_2 B_2 d A_3	$00l: l = 4n + 2$ d A_3		$hhl_c: 2h + l_c = 4n + 2$ A_2 B_2 d A_3
110 $I4_1cd$		$hh0, \bar{h}h0$ A_2 B_2 d A_3	$00l: l = 4n + 2$ d A_3	h_00l_0 A_2 B_2 c A_3	$hhl_c: 2h + l_c = 4n + 2$ A_2 B_2 d A_3

Point group $\bar{4}2m$. The symbol a in the column $[h0l]$ is equivalent to the symbol b in the space groups of the first column.

Space group	Incident-beam direction				
	[100]	[001]	[110]	$[h0l]$	$[hhl]$
111 $P\bar{4}2m$					
112 $P\bar{4}2c$			$00l$ c A_3		hhl_0 A_2 B_2 c A_3
113 $P\bar{4}2_1m$	$0k0$ A_2 B_2 2_{12} B_3	$h00$ A_2 B_2 2_{11} B_3 $0k0$ 2_{12}		$0k0$ A_2 B_2 2_1 B_3	
114 $P\bar{4}2_1c$	$0k0$ A_2 B_2 2_{12} B_3	$h00$ A_2 B_2 2_{11} B_3 $0k0$ 2_{12}	$00l$ c A_3	$0k0$ A_2 B_2 2_1 B_3	hhl_0 A_2 B_2 c A_3
115 $P\bar{4}m2$					
116 $P\bar{4}c2$	$00l$ c_2 A_3			$h0l_0$ A_2 B_2 c A_3	
117 $P\bar{4}b2$		$h00$ A_2 B_2 a_2 A_3 $0k0$ b_1		h_00l A_2 B_2 a A_3	
118 $P\bar{4}n2$	$00l$ n_2 A_3	$h00$ A_2 B_2 n_2 A_3 $0k0$ n_1		$h0l: h + l = 2n + 1$ A_2 B_2 n A_3	
119 $I\bar{4}m2$					
120 $I\bar{4}c2$				h_00l_0 A_2 B_2 c A_3	
121 $I\bar{4}2m$					
122 $I\bar{4}2d$		$hh0, \bar{h}h0$ A_2 B_2 d A_3	$00l: l = 4n + 2$ d A_3		$hhl_c: 2h + l_c = 4n + 2$ A_2 B_2 d A_3

2.5. ELECTRON DIFFRACTION AND ELECTRON MICROSCOPY IN STRUCTURE DETERMINATION

Table 2.5.3.9 (cont.)

 Point group $4/mmm$. The symbol a in the column $[h0l]$ is equivalent to the symbol b in the space groups of the first column.

Space group	Incident-beam direction					
	[100]	[001]	[110]	$[h0l]$	$[hhl]$	$[hk0]$
123 $P4/mmm$ $P4/m2/m2/m$						
124 $P4/mcc$ $P4/m2/c2/c$	$00l$ $c_{12} \quad A_3$		$00l$ $c_2 \quad A_3$	$h0l_0$ A_2 B_2 $c_1 \quad A_3$	hhl_0 A_2 B_2 $c_2 \quad A_3$	
125 $P4/nbm$ $P4/n2/b2/m$	$0k0$ $n \quad A_3$	$h00$ $a_2 \quad A_3$ $0k0$ b_1		h_00l A_2 B_2 $a \quad A_3$		$hk0:$ A_2 B_2 $h + k =$ A_3 $2n + 1$ n
126 $P4/nnc$ $P4/n2/n2/c$	$0k0$ $n_1 \quad A_3$ $00l$ n_{22}	$h00$ $n_{22} \quad A_3$ $0k0$ n_{21}	$00l$ $c \quad A_3$	$h0l:$ A_2 B_2 $h + l =$ A_3 $2n + 1$ n_2	hhl_0 A_2 B_2 $c \quad A_3$	$hk0:$ A_2 B_2 $h + k =$ A_3 $2n + 1$ n_1
127 $P4/mbm$ $P4/m2_1/b2/m$	$0k0$ $2_{12} \quad B_3$	$h00$ A_2 B_2 $a_2, 2_{11}$ A_3 B_3 $0k0$ $b_1, 2_{12}$		h_00l A_2 B_2 $a \quad A_3$ $0k0$ A_2 B_2 $2_1 \quad B_3$		
128 $P4/mnc$ $P4/m2_1/n2/c$	$00l$ A_3 n_2 $0k0$ B_3 2_{12}	$h00$ A_2 B_2 $n_2, 2_{11}$ A_3 B_3 $0k0$ $n_1, 2_{12}$	$00l$ A_3 c	$h0l:$ A_2 B_2 $h + l =$ A_3 $2n + 1$ n $0k0$ A_2 B_2 $2_1 \quad B_3$	hhl_0 A_2 B_2 $c \quad A_3$	
129 $P4/nmm$ $P4/n2_1/m2/m$	$0k0$ A_2 B_2 $n, 2_{12}$ A_3 B_3	$h00$ B_3 2_{11} $0k0$ 2_{12}		$0k0$ A_2 B_2 $2_1 \quad B_3$		$hk0:$ A_2 B_2 $h + k =$ A_3 $2n + 1$ n
130 $P4/ncc$ $P4/n2_1/c2/c$	$0k0$ A_2 B_2 $n, 2_{12}$ A_3 B_3 $00l$ A_3 c_{12}	$h00$ B_3 2_{11} $0k0$ 2_{12}	$00l$ A_3 c_2	$h0l_0$ A_2 B_2 $c_1 \quad A_3$ $0k0$ A_2 B_2 $2_1 \quad B_3$	hhl_0 A_2 B_2 $c_2 \quad A_3$	$hk0:$ A_2 B_2 $h + k =$ A_3 $2n + 1$ n
131 $P4_2/mmc$ $P4_2/m2/m2/c$			$00l$ A_3 c		hhl_0 A_2 B_2 $c \quad A_3$	
132 $P4_2/mcm$ $P4_2/m2/c2/m$	$00l$ A_3 c_2			$h0l_0$ A_2 B_2 $c \quad A_3$		
133 $P4_2/nbc$ $P4_2/n2/b2/c$	$0k0$ A_3 n	$h00$ A_3 a_2 $0k0$ b_1	$00l$ A_3 c	h_00l A_2 B_2 $a \quad A_3$	hhl_0 A_2 B_2 $c \quad A_3$	$hk0:$ A_2 B_2 $h + k =$ A_3 $2n + 1$ n
134 $P4_2/nnm$ $P4_2/n2/n2/m$	$0k0$ A_3 n_1 $00l$ n_{22}	$h00$ A_3 n_{22} $0k0$ n_{21}		$h0l:$ A_2 B_2 $h + l =$ A_3 $2n + 1$ n_2		$hk0:$ A_2 B_2 $h + k =$ A_3 $2n + 1$ n_1
135 $P4_2/mbc$ $P4_2/m2_1/b2/c$	$0k0$ B_3 2_{12}	$h00$ A_2 B_2 $a_2, 2_{11}$ A_3 B_3 $0k0$ $b_1, 2_{12}$	$00l$ A_3 c	h_00l A_2 B_2 $a \quad A_3$ $0k0$ A_2 B_2 $2_1 \quad B_3$	hhl_0 A_2 B_2 $c \quad A_3$	
136 $P4_2/mnm$ $P4_2/m2_1/n2/m$	$00l$ A_3 n_2 $0k0$ B_3 2_{12}	$h00$ A_2 B_2 $n_2, 2_{11}$ A_3 B_3 $0k0$ $n_1, 2_{12}$		$h0l:$ A_2 B_2 $h + l =$ A_3 $2n + 1$ n $0k0$ A_2 B_2 $2_1 \quad B_3$		
137 $P4_2/nmc$ $P4_2/n2_1/m2/c$	$0k0$ A_2 B_2 $n, 2_{12}$ A_3 B_3	$h00$ B_3 2_{11} $0k0$ 2_{12}	$00l$ A_3 c	$0k0$ A_2 B_2 $2_1 \quad B_3$	hhl_0 A_2 B_2 $c \quad A_3$	$hk0:$ A_2 B_2 $h + k =$ A_3 $2n + 1$ n
138 $P4_2/ncm$ $P4_2/n2_1/c2/m$	$0k0$ A_2 B_2 $n, 2_{12}$ A_3 B_3 $00l$ A_3 c_2	$h00$ B_3 2_{11} $0k0$ 2_{12}		$h0l_0$ A_2 B_2 $c \quad A_3$ $0k0$ A_2 B_2 $2_1 \quad B_3$		$hk0:$ A_2 B_2 $h + k =$ A_3 $2n + 1$ n
139 $I4/mmm$ $I4/m2/m2/m$						

2. RECIPROCAL SPACE IN CRYSTAL-STRUCTURE DETERMINATION

Table 2.5.3.9 (cont.)

Space group	Incident-beam direction					
	[100]	[001]	[110]	[h0l]	[hhl]	[hk0]
140 $I4/mcm$ $I4/m2/c2/m$				h_00l_0 c A_2 B_2 A_3		
141 $I4_1/amd$ $I4_1/a2/m2/d$		$hh0, \bar{h}h0$ d A_3	$00l$: $l =$ A_3 $4n + 2$ d $\bar{h}h0$ a		hhl_c : $2h + l_c =$ A_2 B_2 $4n + 2$ d A_3	h_0k0 A_2 B_2 a A_3
142 $I4_1/acd$ $I4_1/a2/c2/d$		$hh0, \bar{h}h0$ d A_3	$00l$: $l =$ A_3 $4n + 2$ d $\bar{h}h0$ a	h_00l_0 A_2 B_2 c A_3	hhl_c : $2h + l_c =$ A_2 B_2 $4n + 2$ d A_3	h_0k0 A_2 B_2 a A_3

Point groups $3, \bar{3}, 32, 3m, \bar{3}m$

Space group	Incident-beam direction	
	[11 $\bar{2}$ 0]	[1 $\bar{1}$ 00]
Nos. 143–155: no GM line		
156 $P3m1$		
157 $P31m$		
158 $P3c1$		$00l$ A_2 B_2 c A_3
159 $P31c$	$00l$ A_2 B_2 c A_3	
160 $R3m$		
161 $R3c$		$00l$: $l = 6n + 3$ A_2 B_2 c A_3
162 $P\bar{3}1m$		
163 $P\bar{3}1c$	$00l$ A_2 B_2 c A_3	
164 $P\bar{3}m1$		
165 $P\bar{3}c1$		$00l$ A_2 B_2 c A_3
166 $R\bar{3}m$		
167 $R\bar{3}c$		$00l$: $l = 6n + 3$ A_2 B_2 c A_3

Point groups $6, \bar{6}, 6/m, 622, 6mm, \bar{6}m2, 6/mmm$

Space group	Incident-beam direction	
	[11 $\bar{2}$ 0]	[1 $\bar{1}$ 00]
168 $P6$		
169 $P6_1$	$00l$ A_2 B_2 6_1 B_3	$00l$ A_2 B_2 6_1 B_3
170 $P6_5$	$00l$ A_2 B_2 6_5 B_3	$00l$ A_2 B_2 6_5 B_3
171 $P6_2$		
172 $P6_4$		
173 $P6_3$	$00l$ A_2 B_2 6_3 B_3	$00l$ A_2 B_2 6_3 B_3
174 $P\bar{6}$		
175 $P6/m$		
176 $P6_3/m$	$00l$ A_2 B_2 6_3 B_3	$00l$ A_2 B_2 6_3 B_3

2.5. ELECTRON DIFFRACTION AND ELECTRON MICROSCOPY IN STRUCTURE DETERMINATION

Table 2.5.3.9 (cont.)

Space group	Incident-beam direction					
	[11 $\bar{2}$ 0]			[1 $\bar{1}$ 00]		
177 $P6_{22}$						
178 $P6_122$	00l 6 ₁	A ₂ B ₂ B ₃	B ₂ B ₃	00l 6 ₁	A ₂ B ₂ B ₃	B ₂ B ₃
179 $P6_522$	00l 6 ₅	A ₂ B ₂ B ₃	B ₂ B ₃	00l 6 ₅	A ₂ B ₂ B ₃	B ₂ B ₃
180 $P6_222$						
181 $P6_422$						
182 $P6_322$	00l 6 ₃	A ₂ B ₂ B ₃	B ₂ B ₃	00l 6 ₃	A ₂ B ₂ B ₃	B ₂ B ₃
183 $P6mm$						
184 $P6cc$	00l c ₂	A ₃		00l c ₁	A ₃	
185 $P6_3cm$	00l 6 ₃		B ₃	00l 6 _{3, c}	A ₂ A ₃	B ₂ B ₃
186 $P6_3mc$	00l 6 _{3, c}	A ₂ A ₃	B ₂ B ₃	00l 6 ₃		B ₃
187 $P\bar{6}m2$						
188 $P\bar{6}c2$				00l c	A ₂ A ₃	B ₂
189 $P\bar{6}2m$						
190 $P\bar{6}2c$	00l c	A ₂ A ₃	B ₂			
191 $P6/mmm$						
192 $P6/mcc$	00l c ₂	A ₃		00l c ₁	A ₃	
193 $P6_3/mcm$	00l 6 ₃		B ₃	00l 6 _{3, c}	A ₂ A ₃	B ₂ B ₃
194 $P6_3/mmc$	00l 6 _{3, c}	A ₂ A ₃	B ₂ B ₃	00l 6 ₃		B ₃

 Point groups 23, $m\bar{3}$

Space group	Incident-beam direction					
	[100] (cyclic)		[110] (cyclic)		[hk0] (cyclic)	
195 $P2_3$						
196 $F2_3$						
197 $I2_3$						
198 $P2_13$	00l 2 ₁₃ 0k0 2 ₁₂	A ₂ B ₂ B ₃	B ₂ B ₃	00l 2 ₁₃	A ₂ B ₂ B ₃	00l 2 ₁ A ₂ B ₂ B ₃
199 $I2_13$						
200 $Pm\bar{3}$ $P2_1/m\bar{3}$						
201 $Pn\bar{3}$ $P2_1/n\bar{3}$	00l n ₂ 0k0 n ₃	A ₃				$\bar{k}h0$ n A ₂ B ₂ A ₃
202 $Fm\bar{3}$ $F2_1/m\bar{3}$						
203 $Fd\bar{3}$ $F2_1/d\bar{3}$	00l: l = 4n + 2 d ₂ 0k0: k = 4n + 2 d ₃	A ₃				$\bar{k}h0$: h + k = 4n + 2 d A ₂ B ₂ A ₃
204 $Im\bar{3}$ $I2_1/m\bar{3}$						
205 $Pa\bar{3}$ $P2_1/a\bar{3}$	00l c ₂ , 2 ₁₃ 0k0 2 ₁₂	A ₂ A ₃	B ₂ B ₃ B ₃	00l 2 ₁₃ $\bar{h}h0$ a ₃	A ₂ B ₂ B ₂ A ₃ A ₃	00l 2 ₁ $\bar{k}h0$ a A ₂ B ₂ A ₃
206 $Ia\bar{3}$ $I2_1/a\bar{3}$				$\bar{h}h0$ a ₃	A ₂ B ₂ A ₃	$\bar{k}h0$ a A ₂ B ₂ A ₃

2. RECIPROCAL SPACE IN CRYSTAL-STRUCTURE DETERMINATION

Table 2.5.3.9 (cont.)

Point group 432

Space group	Incident-beam direction		
	[hk0] (cyclic)		
207 $P432$			
208 $P4_232$			
209 $F432$			
210 $F4_132$			
211 $I432$			
212 $P4_332$	00l 4 ₃	A ₂	B ₂ B ₃
213 $P4_132$	00l 4 ₁	A ₂	B ₂ B ₃
214 $I4_132$			

Point group $\bar{4}3m$

Space group	Incident-beam direction		
	[100] (cyclic)	[110] (cyclic)	[hhl] (cyclic)
215 $P\bar{4}3m$			
216 $F\bar{4}3m$			
217 $I\bar{4}3m$			
218 $P\bar{4}3n$		00l n A ₃	hhl _o n A ₂ B ₂ A ₃
219 $F\bar{4}3c$			h _o h _o l _o c A ₂ B ₂ A ₃
220 $I\bar{4}3d$	0kk, 0 \bar{k} k d A ₂ B ₂ A ₃	00l: l = 4n + 2 d A ₃	hhl _e : 2h + l _e = 4n + 2 d A ₂ B ₂ A ₃

Point group m3m

Space group	Incident-beam direction			
	[100] (cyclic)	[110] (cyclic)	[hk0] (cyclic)	[hhl] (cyclic)
221 $Pm\bar{3}m$ $P4/m\bar{3}2/m$				
222 $Pn\bar{3}n$ $P4/n\bar{3}2/n$	00l n ₁₂ 0k0 n ₁₃ A ₃	00l n ₂ A ₃	hk0: h + k = 2n + 1 n ₁ A ₂ B ₂ A ₃	hhl _o n ₂ A ₂ B ₂ A ₃
223 $Pm\bar{3}n$ $P4_2/m\bar{3}2/n$		00l n A ₃		hhl _o n A ₂ B ₂ A ₃
224 $Pn\bar{3}m$ $P4_2/n\bar{3}2/m$	00l n ₂ 0k0 n ₃ A ₃		hk0: h + k = 2n + 1 n A ₂ B ₂ A ₃	
225 $Fm\bar{3}m$ $F4/m\bar{3}2/m$				
226 $Fm\bar{3}c$ $F4/m\bar{3}2/c$				h _o h _o l _o c A ₂ B ₂ A ₃
227 $Fd\bar{3}m$ $F4_1/d\bar{3}2/m$	00l: l = 4n + 2 d ₂ 0k0: k = 4n + 2 d ₃ A ₃		h _e k _e 0: h _e + k _e = 4n + 2 d A ₂ B ₂ A ₃	
228 $Fd\bar{3}c$ $F4_1/d\bar{3}2/c$	00l: l = 4n + 2 d ₂ 0k0: k = 4n + 2 d ₃ A ₃		h _e k _e 0: h _e + k _e = 4n + 2 d A ₂ B ₂ A ₃	h _o h _o l _o c A ₂ B ₂ A ₃
229 $Im\bar{3}m$ $I4/m\bar{3}2/m$				
230 $Ia\bar{3}d$ $I4_1/a\bar{3}2/d$	0kk, 0 \bar{k} k d A ₃	00l: l = 4n + 2 d h \bar{h} 0 a ₃	h _o k _o 0 a A ₂ B ₂ A ₃	hhl _e : 2h + l _e = 4n + 2 d A ₂ B ₂ A ₃