

MSG No. 141.551 *I4₁/amd* [Type I, tetragonal]

Table 1: Wyckoff site: 4a, site symmetry: -4m2

No.	position	mapping
1	[0, $\frac{3}{4}$, $\frac{1}{8}$]	[1, 6, 12, 13, 23, 24, 26, 27]
2	[$\frac{1}{2}$, $\frac{3}{4}$, $\frac{3}{8}$]	[2, 3, 15, 16, 20, 21, 25, 30]
3	[0, $\frac{1}{4}$, $\frac{7}{8}$]	[4, 5, 9, 14, 18, 19, 31, 32]
4	[$\frac{1}{2}$, $\frac{1}{4}$, $\frac{5}{8}$]	[7, 8, 10, 11, 17, 22, 28, 29]

Table 2: Wyckoff site: 4b, site symmetry: -4m2

No.	position	mapping
1	[0, $\frac{1}{4}$, $\frac{3}{8}$]	[1, 6, 7, 8, 10, 11, 12, 13]
2	[0, $\frac{3}{4}$, $\frac{5}{8}$]	[2, 3, 4, 5, 9, 14, 15, 16]
3	[$\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$]	[17, 22, 23, 24, 26, 27, 28, 29]
4	[$\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$]	[18, 19, 20, 21, 25, 30, 31, 32]

Table 3: Wyckoff site: 8c, site symmetry: .2/m.

No.	position	mapping
1	[0, 0, 0]	[1, 4, 9, 12]
2	[$\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{4}$]	[2, 15, 23, 26]
3	[$\frac{3}{4}$, $\frac{3}{4}$, $\frac{1}{4}$]	[3, 16, 24, 27]
4	[0, $\frac{1}{2}$, 0]	[5, 6, 13, 14]
5	[$\frac{3}{4}$, $\frac{1}{4}$, $\frac{3}{4}$]	[7, 10, 18, 31]
6	[$\frac{1}{4}$, $\frac{1}{4}$, $\frac{3}{4}$]	[8, 11, 19, 32]
7	[$\frac{1}{2}$, $\frac{1}{2}$, $\frac{1}{2}$]	[17, 20, 25, 28]
8	[$\frac{1}{2}$, 0, $\frac{1}{2}$]	[21, 22, 29, 30]

Table 4: Wyckoff site: 8d, site symmetry: .2/m.

No.	position	mapping
1	[0, 0, $\frac{1}{2}$]	[1, 4, 9, 12]
2	[$\frac{1}{4}$, $\frac{3}{4}$, $\frac{3}{4}$]	[2, 15, 23, 26]
3	[$\frac{3}{4}$, $\frac{3}{4}$, $\frac{3}{4}$]	[3, 16, 24, 27]
4	[0, $\frac{1}{2}$, $\frac{1}{2}$]	[5, 6, 13, 14]
5	[$\frac{3}{4}$, $\frac{1}{4}$, $\frac{1}{4}$]	[7, 10, 18, 31]
6	[$\frac{1}{4}$, $\frac{1}{4}$, $\frac{1}{4}$]	[8, 11, 19, 32]
7	[$\frac{1}{2}$, $\frac{1}{2}$, 0]	[17, 20, 25, 28]
8	[$\frac{1}{2}$, 0, 0]	[21, 22, 29, 30]

Table 5: Wyckoff site: 8e, site symmetry: 2mm.

No.	position	mapping
1	$[0, \frac{1}{4}, z]$	[1, 6, 12, 13]
2	$[0, \frac{3}{4}, z + \frac{1}{4}]$	[2, 3, 15, 16]
3	$[0, \frac{3}{4}, -z]$	[4, 5, 9, 14]
4	$[0, \frac{1}{4}, \frac{3}{4} - z]$	[7, 8, 10, 11]
5	$[\frac{1}{2}, \frac{3}{4}, z + \frac{1}{2}]$	[17, 22, 28, 29]
6	$[\frac{1}{2}, \frac{1}{4}, z + \frac{3}{4}]$	[18, 19, 31, 32]
7	$[\frac{1}{2}, \frac{1}{4}, \frac{1}{2} - z]$	[20, 21, 25, 30]
8	$[\frac{1}{2}, \frac{3}{4}, \frac{1}{4} - z]$	[23, 24, 26, 27]

Table 6: Wyckoff site: 16f, site symmetry: .2.

No.	position	mapping
1	$[x, 0, 0]$	[1, 4]
2	$[\frac{1}{4}, x + \frac{3}{4}, \frac{1}{4}]$	[2, 23]
3	$[\frac{3}{4}, \frac{3}{4} - x, \frac{1}{4}]$	[3, 24]
4	$[-x, \frac{1}{2}, 0]$	[5, 6]
5	$[\frac{3}{4}, x + \frac{1}{4}, \frac{3}{4}]$	[7, 18]
6	$[\frac{1}{4}, \frac{1}{4} - x, \frac{3}{4}]$	[8, 19]
7	$[-x, 0, 0]$	[9, 12]
8	$[\frac{3}{4}, \frac{1}{4} - x, \frac{3}{4}]$	[10, 31]
9	$[\frac{1}{4}, x + \frac{1}{4}, \frac{3}{4}]$	[11, 32]
10	$[x, \frac{1}{2}, 0]$	[13, 14]
11	$[\frac{1}{4}, \frac{3}{4} - x, \frac{1}{4}]$	[15, 26]
12	$[\frac{3}{4}, x + \frac{3}{4}, \frac{1}{4}]$	[16, 27]
13	$[x + \frac{1}{2}, \frac{1}{2}, \frac{1}{2}]$	[17, 20]
14	$[\frac{1}{2} - x, 0, \frac{1}{2}]$	[21, 22]
15	$[\frac{1}{2} - x, \frac{1}{2}, \frac{1}{2}]$	[25, 28]
16	$[x + \frac{1}{2}, 0, \frac{1}{2}]$	[29, 30]

Table 7: Wyckoff site: 16g, site symmetry: . .2

No.	position	mapping
1	$[x, x + \frac{1}{4}, \frac{7}{8}]$	[1, 7]
2	$[-x, x + \frac{3}{4}, \frac{1}{8}]$	[2, 5]
3	$[x, \frac{3}{4} - x, \frac{1}{8}]$	[3, 4]
4	$[-x, \frac{1}{4} - x, \frac{7}{8}]$	[6, 8]
5	$[-x, \frac{3}{4} - x, \frac{1}{8}]$	[9, 15]
6	$[x, \frac{1}{4} - x, \frac{7}{8}]$	[10, 13]
7	$[-x, x + \frac{1}{4}, \frac{7}{8}]$	[11, 12]
8	$[x, x + \frac{3}{4}, \frac{1}{8}]$	[14, 16]
9	$[x + \frac{1}{2}, x + \frac{3}{4}, \frac{3}{8}]$	[17, 23]

continued ...

Table 7

No.	position	mapping
10	$[\frac{1}{2} - x, x + \frac{1}{4}, \frac{5}{8}]$	[18,21]
11	$[x + \frac{1}{2}, \frac{1}{4} - x, \frac{5}{8}]$	[19,20]
12	$[\frac{1}{2} - x, \frac{3}{4} - x, \frac{3}{8}]$	[22,24]
13	$[\frac{1}{2} - x, \frac{1}{4} - x, \frac{5}{8}]$	[25,31]
14	$[x + \frac{1}{2}, \frac{3}{4} - x, \frac{3}{8}]$	[26,29]
15	$[\frac{1}{2} - x, x + \frac{3}{4}, \frac{3}{8}]$	[27,28]
16	$[x + \frac{1}{2}, x + \frac{1}{4}, \frac{5}{8}]$	[30,32]

Table 8: Wyckoff site: 16h, site symmetry: .m.

No.	position	mapping
1	$[0, y, z]$	[1,12]
2	$[\frac{1}{4} - y, \frac{3}{4}, z + \frac{1}{4}]$	[2,15]
3	$[y + \frac{3}{4}, \frac{3}{4}, z + \frac{1}{4}]$	[3,16]
4	$[0, -y, -z]$	[4,9]
5	$[0, y + \frac{1}{2}, -z]$	[5,14]
6	$[0, \frac{1}{2} - y, z]$	[6,13]
7	$[y + \frac{3}{4}, \frac{1}{4}, \frac{3}{4} - z]$	[7,10]
8	$[\frac{1}{4} - y, \frac{1}{4}, \frac{3}{4} - z]$	[8,11]
9	$[\frac{1}{2}, y + \frac{1}{2}, z + \frac{1}{2}]$	[17,28]
10	$[\frac{3}{4} - y, \frac{1}{4}, z + \frac{3}{4}]$	[18,31]
11	$[y + \frac{1}{4}, \frac{1}{4}, z + \frac{3}{4}]$	[19,32]
12	$[\frac{1}{2}, \frac{1}{2} - y, \frac{1}{2} - z]$	[20,25]
13	$[\frac{1}{2}, y, \frac{1}{2} - z]$	[21,30]
14	$[\frac{1}{2}, -y, z + \frac{1}{2}]$	[22,29]
15	$[y + \frac{1}{4}, \frac{3}{4}, \frac{1}{4} - z]$	[23,26]
16	$[\frac{3}{4} - y, \frac{3}{4}, \frac{1}{4} - z]$	[24,27]

Table 9: Wyckoff site: 32i, site symmetry: 1

No.	position	mapping
1	$[x, y, z]$	[1]
2	$[\frac{1}{4} - y, x + \frac{3}{4}, z + \frac{1}{4}]$	[2]
3	$[y + \frac{3}{4}, \frac{3}{4} - x, z + \frac{1}{4}]$	[3]
4	$[x, -y, -z]$	[4]
5	$[-x, y + \frac{1}{2}, -z]$	[5]
6	$[-x, \frac{1}{2} - y, z]$	[6]
7	$[y + \frac{3}{4}, x + \frac{1}{4}, \frac{3}{4} - z]$	[7]
8	$[\frac{1}{4} - y, \frac{1}{4} - x, \frac{3}{4} - z]$	[8]
9	$[-x, -y, -z]$	[9]
10	$[y + \frac{3}{4}, \frac{1}{4} - x, \frac{3}{4} - z]$	[10]
11	$[\frac{1}{4} - y, x + \frac{1}{4}, \frac{3}{4} - z]$	[11]

continued ...

Table 9

No.	position	mapping
12	$[-x, y, z]$	[12]
13	$[x, \frac{1}{2} - y, z]$	[13]
14	$[x, y + \frac{1}{2}, -z]$	[14]
15	$[\frac{1}{4} - y, \frac{3}{4} - x, z + \frac{1}{4}]$	[15]
16	$[y + \frac{3}{4}, x + \frac{3}{4}, z + \frac{1}{4}]$	[16]
17	$[x + \frac{1}{2}, y + \frac{1}{2}, z + \frac{1}{2}]$	[17]
18	$[\frac{3}{4} - y, x + \frac{1}{4}, z + \frac{3}{4}]$	[18]
19	$[y + \frac{1}{4}, \frac{1}{4} - x, z + \frac{3}{4}]$	[19]
20	$[x + \frac{1}{2}, \frac{1}{2} - y, \frac{1}{2} - z]$	[20]
21	$[\frac{1}{2} - x, y, \frac{1}{2} - z]$	[21]
22	$[\frac{1}{2} - x, -y, z + \frac{1}{2}]$	[22]
23	$[y + \frac{1}{4}, x + \frac{3}{4}, \frac{1}{4} - z]$	[23]
24	$[\frac{3}{4} - y, \frac{3}{4} - x, \frac{1}{4} - z]$	[24]
25	$[\frac{1}{2} - x, \frac{1}{2} - y, \frac{1}{2} - z]$	[25]
26	$[y + \frac{1}{4}, \frac{3}{4} - x, \frac{1}{4} - z]$	[26]
27	$[\frac{3}{4} - y, x + \frac{3}{4}, \frac{1}{4} - z]$	[27]
28	$[\frac{1}{2} - x, y + \frac{1}{2}, z + \frac{1}{2}]$	[28]
29	$[x + \frac{1}{2}, -y, z + \frac{1}{2}]$	[29]
30	$[x + \frac{1}{2}, y, \frac{1}{2} - z]$	[30]
31	$[\frac{3}{4} - y, \frac{1}{4} - x, z + \frac{3}{4}]$	[31]
32	$[y + \frac{1}{4}, x + \frac{1}{4}, z + \frac{3}{4}]$	[32]