

MSG No. 192.248 $P6'/m'c'c$ [Type III, hexagonal]

Table 1: Wyckoff site: 2a, site symmetry: 6'2'2

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

Table 2: Wyckoff site: 2b, site symmetry: 6'/m'..

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

Table 3: Wyckoff site: 4c, site symmetry: 3.2

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

Table 4: Wyckoff site: 4d, site symmetry: -6'..

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

Table 5: Wyckoff site: 4e, site symmetry: 6'..

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

Table 6: Wyckoff site: 6f, site symmetry: 2'2'2

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

Table 7: Wyckoff site: 6g, site symmetry: 2'/m'..

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

Table 8: Wyckoff site: 8h, site symmetry: 3..

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

Table 9: Wyckoff site: 12i, site symmetry: 2'..

No.	position	mapping
1	$[\frac{1}{2}, 0, z]$	[1, 14]
2	$[0, \frac{1}{2}, z]$	[2, 15]
3	$[\frac{1}{2}, \frac{1}{2}, z]$	[3, 13]
4	$[\frac{1}{2}, \frac{1}{2}, \frac{1}{2} - z]$	[4, 18]
5	$[\frac{1}{2}, 0, \frac{1}{2} - z]$	[5, 16]
6	$[0, \frac{1}{2}, \frac{1}{2} - z]$	[6, 17]
7	$[\frac{1}{2}, 0, -z]$	[7, 20]

continued ...

Table 9

No.	position	mapping
8	$[0, \frac{1}{2}, -z]$	[8,21]
9	$[\frac{1}{2}, \frac{1}{2}, -z]$	[9,19]
10	$[\frac{1}{2}, \frac{1}{2}, z + \frac{1}{2}]$	[10,24]
11	$[\frac{1}{2}, 0, z + \frac{1}{2}]$	[11,22]
12	$[0, \frac{1}{2}, z + \frac{1}{2}]$	[12,23]

Table 10: Wyckoff site: 12j, site symmetry: .2'.

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

Table 11: Wyckoff site: 12k, site symmetry: ..2

No.	position	mapping
1	$[x, 2x, \frac{1}{4}]$	[1,5]
2	$[-2x, -x, \frac{1}{4}]$	[2,6]
3	$[x, -x, \frac{1}{4}]$	[3,4]
4	$[-x, -2x, \frac{3}{4}]$	[7,11]
5	$[2x, x, \frac{3}{4}]$	[8,12]
6	$[-x, x, \frac{3}{4}]$	[9,10]
7	$[-x, x, \frac{1}{4}]$	[13,18]
8	$[-x, -2x, \frac{1}{4}]$	[14,16]
9	$[2x, x, \frac{1}{4}]$	[15,17]
10	$[x, -x, \frac{3}{4}]$	[19,24]
11	$[x, 2x, \frac{3}{4}]$	[20,22]
12	$[-2x, -x, \frac{3}{4}]$	[21,23]

Table 12: Wyckoff site: 121, site symmetry: $\mathbf{m}'\dots$

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

Table 13: Wyckoff site: 24m, site symmetry: 1

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