MSG No. 208.46 $P4_2'32'$ [Type III, cubic]

Table 1: Wyckoff site: 2a, site symmetry: 23.

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

Table 2: Wyckoff site: 4b, site symmetry: .32'

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

Table 3: Wyckoff site: 4c, site symmetry: .32'

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

Table 4: Wyckoff site: 6d, site symmetry: 222..

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

Table 5: Wyckoff site: 6e, site symmetry: 2.2'2'

No.	position	mapping
1	$\left[\frac{1}{4}, 0, \frac{1}{2}\right]$	[1,2,21,22]
2	$\left[\frac{3}{4}, 0, \frac{1}{2}\right]$	[3,4,13,14]

Table 5

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

Table 6: Wyckoff site: 6f, site symmetry: 2.2'2'

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

Table 7: Wyckoff site: 8g, site symmetry: .3.

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

Table 8: Wyckoff site: 12h, site symmetry: 2..

No.	position	mapping
1	$[x, 0, 0]$	[1,2]
2	$[-x, 0, 0]$	[3,4]
3	$[0, x, 0]$	[5,12]
4	$[0, 0, x]$	[6,9]
5	$[0, 0, -x]$	[7,11]
6	$[0, -x, 0]$	[8,10]
7	$\left[x+\frac{1}{2}, \frac{1}{2}, \frac{1}{2}\right]$	[13,14]
8	$\left[\frac{1}{2}, \frac{1}{2}, \frac{1}{2}-x\right]$	[15,24]
9	$\left[\frac{1}{2}, \frac{1}{2}, x+\frac{1}{2}\right]$	[16,23]

continued ...

Table 8

No.	position	mapping
10	$\left[\frac{1}{2}, x+\frac{1}{2}, \frac{1}{2}\right]$	[17,19]
11	$\left[\frac{1}{2}, \frac{1}{2}-x, \frac{1}{2}\right]$	[18,20]
12	$\left[\frac{1}{2}-x, \frac{1}{2}, \frac{1}{2}\right]$	[21,22]

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

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

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

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

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

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

Table 12: Wyckoff site: `12l`, site symmetry: `..2'`

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

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

No.	position	mapping
1	$[x, y, z]$	[1]
2	$[x, -y, -z]$	[2]
3	$[-x, y, -z]$	[3]
4	$[-x, -y, z]$	[4]
5	$[z, x, y]$	[5]
6	$[y, z, x]$	[6]
7	$[-y, z, -x]$	[7]
8	$[-z, -x, y]$	[8]
9	$[-y, -z, x]$	[9]

continued ...

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Table 13

No.	position	mapping
10	$[z,\ -x,\ -y]$	[10]
11	$[y,\ -z,\ -x]$	[11]
12	$[-z,\ x,\ -y]$	[12]
13	$\left[x+\frac{1}{2},\ \frac{1}{2}-z,\ y+\frac{1}{2}\right]$	[13]
14	$\left[x+\frac{1}{2},\ z+\frac{1}{2},\ \frac{1}{2}-y\right]$	[14]
15	$\left[z+\frac{1}{2},\ y+\frac{1}{2},\ \frac{1}{2}-x\right]$	[15]
16	$\left[\frac{1}{2}-z,\ y+\frac{1}{2},\ x+\frac{1}{2}\right]$	[16]
17	$\left[\frac{1}{2}-y,\ x+\frac{1}{2},\ z+\frac{1}{2}\right]$	[17]
18	$\left[y+\frac{1}{2},\ \frac{1}{2}-x,\ z+\frac{1}{2}\right]$	[18]
19	$\left[y+\frac{1}{2},\ x+\frac{1}{2},\ \frac{1}{2}-z\right]$	[19]
20	$\left[\frac{1}{2}-y,\ \frac{1}{2}-x,\ \frac{1}{2}-z\right]$	[20]
21	$\left[\frac{1}{2}-x,\ z+\frac{1}{2},\ y+\frac{1}{2}\right]$	[21]
22	$\left[\frac{1}{2}-x,\ \frac{1}{2}-z,\ \frac{1}{2}-y\right]$	[22]
23	$\left[z+\frac{1}{2},\ \frac{1}{2}-y,\ x+\frac{1}{2}\right]$	[23]
24	$\left[\frac{1}{2}-z,\ \frac{1}{2}-y,\ \frac{1}{2}-x\right]$	[24]