# MSG No. 10.48 $P_b2/m$ [ Type IV, monoclinic ]

Table 1: Wyckoff site: `2a`, site symmetry: `2/m`

| No. | position | mapping |
|---|---|---|
| 1 | $[0, 0, 0]$ | `[1,2,3,4]` |
| 2 | $\left[0, \frac{1}{2}, 0\right]$ | `[5,6,7,8]` |

Table 2: Wyckoff site: `2b`, site symmetry: `2/m'`

| No. | position | mapping |
|---|---|---|
| 1 | $\left[0, \frac{1}{4}, 0\right]$ | `[1,2,7,8]` |
| 2 | $\left[0, \frac{3}{4}, 0\right]$ | `[3,4,5,6]` |

Table 3: Wyckoff site: `2c`, site symmetry: `2/m`

| No. | position | mapping |
|---|---|---|
| 1 | $\left[0, 0, \frac{1}{2}\right]$ | `[1,2,3,4]` |
| 2 | $\left[0, \frac{1}{2}, \frac{1}{2}\right]$ | `[5,6,7,8]` |

Table 4: Wyckoff site: `2d`, site symmetry: `2/m`

| No. | position | mapping |
|---|---|---|
| 1 | $\left[\frac{1}{2}, 0, 0\right]$ | `[1,2,3,4]` |
| 2 | $\left[\frac{1}{2}, \frac{1}{2}, 0\right]$ | `[5,6,7,8]` |

Table 5: Wyckoff site: `2e`, site symmetry: `2/m'`

| No. | position | mapping |
|---|---|---|
| 1 | $\left[\frac{1}{2}, \frac{1}{4}, 0\right]$ | `[1,2,7,8]` |
| 2 | $\left[\frac{1}{2}, \frac{3}{4}, 0\right]$ | `[3,4,5,6]` |

Table 6: Wyckoff site: `2f`, site symmetry: `2/m'`

| No. | position | mapping |
|---|---|---|
| 1 | $\left[0, \frac{1}{4}, \frac{1}{2}\right]$ | `[1,2,7,8]` |
| 2 | $\left[0, \frac{3}{4}, \frac{1}{2}\right]$ | `[3,4,5,6]` |

Table 7: Wyckoff site: `2g`, site symmetry: `2/m`

| No. | position | mapping |
|---|---|---|
| 1 | $\left[\frac{1}{2},\ 0,\ \frac{1}{2}\right]$ | `[1,2,3,4]` |
| 2 | $\left[\frac{1}{2},\ \frac{1}{2},\ \frac{1}{2}\right]$ | `[5,6,7,8]` |

Table 8: Wyckoff site: `2h`, site symmetry: `2/m'`

| No. | position | mapping |
|---|---|---|
| 1 | $\left[\frac{1}{2},\ \frac{1}{4},\ \frac{1}{2}\right]$ | `[1,2,7,8]` |
| 2 | $\left[\frac{1}{2},\ \frac{3}{4},\ \frac{1}{2}\right]$ | `[3,4,5,6]` |

Table 9: Wyckoff site: `4i`, site symmetry: `2`

| No. | position | mapping |
|---|---|---|
| 1 | $[0,\ y,\ 0]$ | `[1,2]` |
| 2 | $[0,\ -y,\ 0]$ | `[3,4]` |
| 3 | $\left[0,\ y+\frac{1}{2},\ 0\right]$ | `[5,6]` |
| 4 | $\left[0,\ \frac{1}{2}-y,\ 0\right]$ | `[7,8]` |

Table 10: Wyckoff site: `4j`, site symmetry: `2`

| No. | position | mapping |
|---|---|---|
| 1 | $\left[\frac{1}{2},\ y,\ 0\right]$ | `[1,2]` |
| 2 | $\left[\frac{1}{2},\ -y,\ 0\right]$ | `[3,4]` |
| 3 | $\left[\frac{1}{2},\ y+\frac{1}{2},\ 0\right]$ | `[5,6]` |
| 4 | $\left[\frac{1}{2},\ \frac{1}{2}-y,\ 0\right]$ | `[7,8]` |

Table 11: Wyckoff site: `4k`, site symmetry: `2`

| No. | position | mapping |
|---|---|---|
| 1 | $\left[0,\ y,\ \frac{1}{2}\right]$ | `[1,2]` |
| 2 | $\left[0,\ -y,\ \frac{1}{2}\right]$ | `[3,4]` |
| 3 | $\left[0,\ y+\frac{1}{2},\ \frac{1}{2}\right]$ | `[5,6]` |
| 4 | $\left[0,\ \frac{1}{2}-y,\ \frac{1}{2}\right]$ | `[7,8]` |

Table 12: Wyckoff site: `4l`, site symmetry: `2`

| No. | position | mapping |
|---|---|---|
| 1 | $\left[\frac{1}{2},\, y,\, \frac{1}{2}\right]$ | `[1,2]` |
| 2 | $\left[\frac{1}{2},\, -y,\, \frac{1}{2}\right]$ | `[3,4]` |
| 3 | $\left[\frac{1}{2},\, y+\frac{1}{2},\, \frac{1}{2}\right]$ | `[5,6]` |
| 4 | $\left[\frac{1}{2},\, \frac{1}{2}-y,\, \frac{1}{2}\right]$ | `[7,8]` |

Table 13: Wyckoff site: `4m`, site symmetry: `m`

| No. | position | mapping |
|---|---|---|
| 1 | $[x,\, 0,\, z]$ | `[1,4]` |
| 2 | $[-x,\, 0,\, -z]$ | `[2,3]` |
| 3 | $\left[x,\, \frac{1}{2},\, z\right]$ | `[5,8]` |
| 4 | $\left[-x,\, \frac{1}{2},\, -z\right]$ | `[6,7]` |

Table 14: Wyckoff site: `4n`, site symmetry: `m'`

| No. | position | mapping |
|---|---|---|
| 1 | $\left[x,\, \frac{1}{4},\, z\right]$ | `[1,8]` |
| 2 | $\left[-x,\, \frac{1}{4},\, -z\right]$ | `[2,7]` |
| 3 | $\left[-x,\, \frac{3}{4},\, -z\right]$ | `[3,6]` |
| 4 | $\left[x,\, \frac{3}{4},\, z\right]$ | `[4,5]` |

Table 15: Wyckoff site: `8o`, 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 | $\left[x,\, y+\frac{1}{2},\, z\right]$ | `[5]` |
| 6 | $\left[-x,\, y+\frac{1}{2},\, -z\right]$ | `[6]` |
| 7 | $\left[-x,\, \frac{1}{2}-y,\, -z\right]$ | `[7]` |
| 8 | $\left[x,\, \frac{1}{2}-y,\, z\right]$ | `[8]` |