# PG No. 19 $C_{3v}$ $3m$ (3m1 setting) [ trigonal ]

* Wyckoff site: `1a`, site symmetry: `3m`.

Table 1: Wyckoff bond: `1a@1a`

| No. | vector | center | mapping |
|---|---|---|---|
| 1 | [0, 0, $Z$] | [0, 0, $z$] | `[1,2,3,4,5,6]` |

Table 2: Wyckoff bond: `3b@1a`

| No. | vector | center | mapping |
|---|---|---|---|
| 1 | [$X$, $-X$, $Z$] | [0, 0, $z$] | `[1,4]` |
| 2 | [$X$, $2X$, $Z$] | [0, 0, $z$] | `[2,6]` |
| 3 | [$-2X$, $-X$, $Z$] | [0, 0, $z$] | `[3,5]` |

Table 3: Wyckoff bond: `3c@1a`

| No. | vector | center | mapping |
|---|---|---|---|
| 1 | [$X$, 0, 0] | [0, 0, $z$] | `[1,-5]` |
| 2 | [0, $X$, 0] | [0, 0, $z$] | `[2,-4]` |
| 3 | [$-X$, $-X$, 0] | [0, 0, $z$] | `[3,-6]` |

Table 4: Wyckoff bond: `6d@1a`

| No. | vector | center | mapping |
|---|---|---|---|
| 1 | [$X$, $Y$, $Z$] | [0, 0, $z$] | `[1]` |
| 2 | [$-Y$, $X-Y$, $Z$] | [0, 0, $z$] | `[2]` |
| 3 | [$-X+Y$, $-X$, $Z$] | [0, 0, $z$] | `[3]` |
| 4 | [$-Y$, $-X$, $Z$] | [0, 0, $z$] | `[4]` |
| 5 | [$-X+Y$, $Y$, $Z$] | [0, 0, $z$] | `[5]` |
| 6 | [$X$, $X-Y$, $Z$] | [0, 0, $z$] | `[6]` |

* Wyckoff site: `3b`, site symmetry: `.m.`

Table 5: Wyckoff bond: `3a@3b`

| No. | vector | center | mapping |
|---|---|---|---|
| 1 | [$X$, $-X$, $Z$] | [$x$, $-x$, $z$] | `[1,4]` |
| 2 | [$X$, $2X$, $Z$] | [$x$, $2x$, $z$] | `[2,6]` |
| 3 | [$-2X$, $-X$, $Z$] | [$-2x$, $-x$, $z$] | `[3,5]` |

Table 6: Wyckoff bond: `3b@3b`

| No. | vector | center | mapping |
|---|---|---|---|
| 1 | $[X, X, 0]$ | $[x, -x, z]$ | `[1,-4]` |
| 2 | $[-X, 0, 0]$ | $[x, 2x, z]$ | `[2,-6]` |
| 3 | $[0, -X, 0]$ | $[-2x, -x, z]$ | `[3,-5]` |

Table 7: Wyckoff bond: `6c@3b`

| No. | vector | center | mapping |
|---|---|---|---|
| 1 | $[X, Y, Z]$ | $[x, -x, z]$ | `[1]` |
| 2 | $[-Y, X-Y, Z]$ | $[x, 2x, z]$ | `[2]` |
| 3 | $[-X+Y, -X, Z]$ | $[-2x, -x, z]$ | `[3]` |
| 4 | $[-Y, -X, Z]$ | $[x, -x, z]$ | `[4]` |
| 5 | $[-X+Y, Y, Z]$ | $[-2x, -x, z]$ | `[5]` |
| 6 | $[X, X-Y, Z]$ | $[x, 2x, z]$ | `[6]` |

* Wyckoff site: `6c`, site symmetry: `1`

Table 8: Wyckoff bond: `6a@6c`

| No. | vector | center | mapping |
|---|---|---|---|
| 1 | $[X, Y, Z]$ | $[x, y, z]$ | `[1]` |
| 2 | $[-Y, X-Y, Z]$ | $[-y, x-y, z]$ | `[2]` |
| 3 | $[-X+Y, -X, Z]$ | $[-x+y, -x, z]$ | `[3]` |
| 4 | $[-Y, -X, Z]$ | $[-y, -x, z]$ | `[4]` |
| 5 | $[-X+Y, Y, Z]$ | $[-x+y, y, z]$ | `[5]` |
| 6 | $[X, X-Y, Z]$ | $[x, x-y, z]$ | `[6]` |