SG No. 22 D_2^7 $F222$ [orthorhombic]

* plus set: $+[0,\ 0,\ 0]$, $+\left[0,\ \frac{1}{2},\ \frac{1}{2}\right]$, $+\left[\frac{1}{2},\ 0,\ \frac{1}{2}\right]$, $+\left[\frac{1}{2},\ \frac{1}{2},\ 0\right]$
* Wyckoff site: `4a`, site symmetry: `222`

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

No.	vector	center	mapping
1	$[0,\ 0,\ Z]$	$[0,\ 0,\ 0]$	`[1,2,-3,-4]`

Table 2: Wyckoff bond: `4b@4a`

No.	vector	center	mapping
1	$[0,\ Y,\ 0]$	$[0,\ 0,\ 0]$	`[1,-2,3,-4]`

Table 3: Wyckoff bond: `4c@4a`

No.	vector	center	mapping
1	$[X,\ 0,\ 0]$	$[0,\ 0,\ 0]$	`[1,-2,-3,4]`

Table 4: Wyckoff bond: `8d@4a`

No.	vector	center	mapping
1	$[X,\ Y,\ 0]$	$[0,\ 0,\ 0]$	`[1,-2]`
2	$[-X,\ Y,\ 0]$	$[0,\ 0,\ 0]$	`[3,-4]`

Table 5: Wyckoff bond: `8e@4a`

No.	vector	center	mapping
1	$[X,\ 0,\ Z]$	$[0,\ 0,\ 0]$	`[1,-3]`
2	$[-X,\ 0,\ Z]$	$[0,\ 0,\ 0]$	`[2,-4]`

Table 6: Wyckoff bond: `8f@4a`

No.	vector	center	mapping
1	$[0,\ Y,\ Z]$	$[0,\ 0,\ 0]$	`[1,-4]`
2	$[0,\ -Y,\ Z]$	$[0,\ 0,\ 0]$	`[2,-3]`

Table 7: Wyckoff bond: `16g@4a`

No.	vector	center	mapping
1	$[X, Y, Z]$	$[0, 0, 0]$	`[1]`
2	$[-X, -Y, Z]$	$[0, 0, 0]$	`[2]`
3	$[-X, Y, -Z]$	$[0, 0, 0]$	`[3]`
4	$[X, -Y, -Z]$	$[0, 0, 0]$	`[4]`

* Wyckoff site: `4b`, site symmetry: `222`

Table 8: Wyckoff bond: `4a@4b`

No.	vector	center	mapping
1	$[0, 0, Z]$	$\left[0, 0, \frac{1}{2}\right]$	`[1,2,-3,-4]`

Table 9: Wyckoff bond: `4b@4b`

No.	vector	center	mapping
1	$[0, Y, 0]$	$\left[0, 0, \frac{1}{2}\right]$	`[1,-2,3,-4]`

Table 10: Wyckoff bond: `4c@4b`

No.	vector	center	mapping
1	$[X, 0, 0]$	$\left[0, 0, \frac{1}{2}\right]$	`[1,-2,-3,4]`

Table 11: Wyckoff bond: `8d@4b`

No.	vector	center	mapping
1	$[X, Y, 0]$	$\left[0, 0, \frac{1}{2}\right]$	`[1,-2]`
2	$[-X, Y, 0]$	$\left[0, 0, \frac{1}{2}\right]$	`[3,-4]`

Table 12: Wyckoff bond: `8e@4b`

No.	vector	center	mapping
1	$[X, 0, Z]$	$\left[0, 0, \frac{1}{2}\right]$	`[1,-3]`
2	$[-X, 0, Z]$	$\left[0, 0, \frac{1}{2}\right]$	`[2,-4]`

Table 13: Wyckoff bond: `8f@4b`

No.	vector	center	mapping
1	$[0, Y, Z]$	$\left[0, 0, \frac{1}{2}\right]$	`[1,-4]`
2	$[0, -Y, Z]$	$\left[0, 0, \frac{1}{2}\right]$	`[2,-3]`

Table 14: Wyckoff bond: `16g@4b`

No.	vector	center	mapping
1	$[X, Y, Z]$	$\left[0, 0, \frac{1}{2}\right]$	`[1]`
2	$[-X, -Y, Z]$	$\left[0, 0, \frac{1}{2}\right]$	`[2]`
3	$[-X, Y, -Z]$	$\left[0, 0, \frac{1}{2}\right]$	`[3]`
4	$[X, -Y, -Z]$	$\left[0, 0, \frac{1}{2}\right]$	`[4]`

* Wyckoff site: `4c`, site symmetry: `222`

Table 15: Wyckoff bond: `4a@4c`

No.	vector	center	mapping
1	$[0, 0, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{1}{4}\right]$	`[1,2,-3,-4]`

Table 16: Wyckoff bond: `4b@4c`

No.	vector	center	mapping
1	$[0, Y, 0]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{1}{4}\right]$	`[1,-2,3,-4]`

Table 17: Wyckoff bond: `4c@4c`

No.	vector	center	mapping
1	$[X, 0, 0]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{1}{4}\right]$	`[1,-2,-3,4]`

Table 18: Wyckoff bond: `8d@4c`

No.	vector	center	mapping
1	$[X, Y, 0]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{1}{4}\right]$	`[1,-2]`
2	$[-X, Y, 0]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{1}{4}\right]$	`[3,-4]`

Table 19: Wyckoff bond: `8e@4c`

No.	vector	center	mapping
1	$[X, 0, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{1}{4}\right]$	`[1,-3]`
2	$[-X, 0, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{1}{4}\right]$	`[2,-4]`

Table 20: Wyckoff bond: `8f@4c`

No.	vector	center	mapping
1	$[0, Y, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{1}{4}\right]$	`[1,-4]`
2	$[0, -Y, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{1}{4}\right]$	`[2,-3]`

Table 21: Wyckoff bond: `16g@4c`

No.	vector	center	mapping
1	$[X, Y, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{1}{4}\right]$	`[1]`
2	$[-X, -Y, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{1}{4}\right]$	`[2]`
3	$[-X, Y, -Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{1}{4}\right]$	`[3]`
4	$[X, -Y, -Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{1}{4}\right]$	`[4]`

* Wyckoff site: `4d`, site symmetry: `222`

Table 22: Wyckoff bond: `4a@4d`

No.	vector	center	mapping
1	$[0, 0, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{3}{4}\right]$	`[1,2,-3,-4]`

Table 23: Wyckoff bond: `4b@4d`

No.	vector	center	mapping
1	$[0, Y, 0]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{3}{4}\right]$	`[1,-2,3,-4]`

Table 24: Wyckoff bond: `4c@4d`

No.	vector	center	mapping
1	$[X, 0, 0]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{3}{4}\right]$	`[1,-2,-3,4]`

Table 25: Wyckoff bond: `8d@4d`

No.	vector	center	mapping
1	$[X, Y, 0]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{3}{4}\right]$	`[1,-2]`
2	$[-X, Y, 0]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{3}{4}\right]$	`[3,-4]`

Table 26: Wyckoff bond: `8e@4d`

No.	vector	center	mapping
1	$[X, 0, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{3}{4}\right]$	`[1,-3]`
2	$[-X, 0, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{3}{4}\right]$	`[2,-4]`

Table 27: Wyckoff bond: `8f@4d`

No.	vector	center	mapping
1	$[0, Y, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{3}{4}\right]$	`[1,-4]`
2	$[0, -Y, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{3}{4}\right]$	`[2,-3]`

Table 28: Wyckoff bond: `16g@4d`

No.	vector	center	mapping
1	$[X, Y, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{3}{4}\right]$	`[1]`
2	$[-X, -Y, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{3}{4}\right]$	`[2]`
3	$[-X, Y, -Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{3}{4}\right]$	`[3]`
4	$[X, -Y, -Z]$	$\left[\frac{1}{4}, \frac{1}{4}, \frac{3}{4}\right]$	`[4]`

* Wyckoff site: `8e`, site symmetry: `2..`

Table 29: Wyckoff bond: `8a@8e`

No.	vector	center	mapping
1	$[0, Y, Z]$	$[x, 0, 0]$	`[1,-4]`
2	$[0, -Y, Z]$	$[-x, 0, 0]$	`[2,-3]`

Table 30: Wyckoff bond: `8b@8e`

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

Table 31: Wyckoff bond: `16c@8e`

No.	vector	center	mapping
1	$[X, Y, Z]$	$[x, 0, 0]$	`[1]`
2	$[-X, -Y, Z]$	$[-x, 0, 0]$	`[2]`
3	$[-X, Y, -Z]$	$[-x, 0, 0]$	`[3]`
4	$[X, -Y, -Z]$	$[x, 0, 0]$	`[4]`

* Wyckoff site: `8f`, site symmetry: `.2.`

Table 32: Wyckoff bond: `8a@8f`

No.	vector	center	mapping
1	$[X, 0, Z]$	$[0, y, 0]$	`[1,-3]`
2	$[-X, 0, Z]$	$[0, -y, 0]$	`[2,-4]`

Table 33: Wyckoff bond: `8b@8f`

No.	vector	center	mapping
1	$[0, Y, 0]$	$[0, y, 0]$	`[1,3]`
2	$[0, -Y, 0]$	$[0, -y, 0]$	`[2,4]`

Table 34: Wyckoff bond: `16c@8f`

No.	vector	center	mapping
1	$[X, Y, Z]$	$[0, y, 0]$	`[1]`
2	$[-X, -Y, Z]$	$[0, -y, 0]$	`[2]`
3	$[-X, Y, -Z]$	$[0, y, 0]$	`[3]`
4	$[X, -Y, -Z]$	$[0, -y, 0]$	`[4]`

* Wyckoff site: `8g`, site symmetry: `..2`

Table 35: Wyckoff bond: `8a@8g`

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

Table 36: Wyckoff bond: `8b@8g`

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

Table 37: Wyckoff bond: `16c@8g`

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

* Wyckoff site: `8h`, site symmetry: `..2`

Table 38: Wyckoff bond: `8a@8h`

No.	vector	center	mapping
1	$[X, Y, 0]$	$\left[\frac{1}{4}, \frac{1}{4}, z\right]$	`[1,-2]`
2	$[-X, Y, 0]$	$\left[\frac{3}{4}, \frac{1}{4}, -z\right]$	`[3,-4]`

Table 39: Wyckoff bond: `8b@8h`

No.	vector	center	mapping
1	$[0, 0, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, z\right]$	`[1,2]`
2	$[0, 0, -Z]$	$\left[\frac{3}{4}, \frac{1}{4}, -z\right]$	`[3,4]`

Table 40: Wyckoff bond: `16c@8h`

No.	vector	center	mapping
1	$[X, Y, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, z\right]$	`[1]`
2	$[-X, -Y, Z]$	$\left[\frac{1}{4}, \frac{1}{4}, z\right]$	`[2]`
3	$[-X, Y, -Z]$	$\left[\frac{3}{4}, \frac{1}{4}, -z\right]$	`[3]`
4	$[X, -Y, -Z]$	$\left[\frac{3}{4}, \frac{1}{4}, -z\right]$	`[4]`

* Wyckoff site: `8i`, site symmetry: `.2.`

Table 41: Wyckoff bond: `8a@8i`

No.	vector	center	mapping
1	$[X, 0, Z]$	$\left[\frac{1}{4}, y, \frac{1}{4}\right]$	`[1,-3]`
2	$[-X, 0, Z]$	$\left[\frac{3}{4}, -y, \frac{1}{4}\right]$	`[2,-4]`

Table 42: Wyckoff bond: `8b@8i`

No.	vector	center	mapping
1	$[0, Y, 0]$	$\left[\frac{1}{4}, y, \frac{1}{4}\right]$	`[1,3]`
2	$[0, -Y, 0]$	$\left[\frac{3}{4}, -y, \frac{1}{4}\right]$	`[2,4]`

Table 43: Wyckoff bond: `16c@8i`

No.	vector	center	mapping
1	$[X, Y, Z]$	$\left[\frac{1}{4}, y, \frac{1}{4}\right]$	`[1]`
2	$[-X, -Y, Z]$	$\left[\frac{3}{4}, -y, \frac{1}{4}\right]$	`[2]`
3	$[-X, Y, -Z]$	$\left[\frac{1}{4}, y, \frac{1}{4}\right]$	`[3]`
4	$[X, -Y, -Z]$	$\left[\frac{3}{4}, -y, \frac{1}{4}\right]$	`[4]`

* Wyckoff site: `8j`, site symmetry: `2..`

Table 44: Wyckoff bond: `8a@8j`

No.	vector	center	mapping
1	$[0, Y, Z]$	$\left[x, \frac{1}{4}, \frac{1}{4}\right]$	`[1,-4]`
2	$[0, -Y, Z]$	$\left[-x, \frac{3}{4}, \frac{1}{4}\right]$	`[2,-3]`

Table 45: Wyckoff bond: `8b@8j`

No.	vector	center	mapping
1	$[X, 0, 0]$	$\left[x, \frac{1}{4}, \frac{1}{4}\right]$	`[1,4]`
2	$[-X, 0, 0]$	$\left[-x, \frac{3}{4}, \frac{1}{4}\right]$	`[2,3]`

Table 46: Wyckoff bond: `16c@8j`

No.	vector	center	mapping
1	$[X, Y, Z]$	$\left[x, \frac{1}{4}, \frac{1}{4}\right]$	`[1]`
2	$[-X, -Y, Z]$	$\left[-x, \frac{3}{4}, \frac{1}{4}\right]$	`[2]`
3	$[-X, Y, -Z]$	$\left[-x, \frac{3}{4}, \frac{1}{4}\right]$	`[3]`
4	$[X, -Y, -Z]$	$\left[x, \frac{1}{4}, \frac{1}{4}\right]$	`[4]`

* Wyckoff site: `16k`, site symmetry: `1`

Table 47: Wyckoff bond: `16a@16k`

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