SAMB for "graphene"

- Group: No. 191 D_{6h}^1 $P6/mmm$ [hexagonal]
- Associated point group: No. 27 D_{6h} $6/mmm$ [hexagonal]

- Generation condition
  - model type: `tight_binding`
  - time-reversal type: `electric`
  - irrep: `[A1g]`
  - `spinless`

- Unit cell:
  $a = 1.0,\ b = 1.0,\ c = 4.0,\ \alpha = 90.0,\ \beta = 90.0,\ \gamma = 120.0$
- Lattice vectors:
  $\boldsymbol{a}_1 = \begin{pmatrix} 1.0 & 0 & 0 \end{pmatrix}$
  $\boldsymbol{a}_2 = \begin{pmatrix} -0.5 & 0.86602540378444 & 0 \end{pmatrix}$
  $\boldsymbol{a}_3 = \begin{pmatrix} 0 & 0 & 4.0 \end{pmatrix}$

Table 1: High-symmetry line: Γ-K-M-Γ.

symbol	position	symbol	position	symbol	position
Γ	$\begin{pmatrix} 0 & 0 & 0 \end{pmatrix}$	M	$\begin{pmatrix} \frac{1}{2} & 0 & 0 \end{pmatrix}$	K	$\begin{pmatrix} \frac{1}{3} & \frac{1}{3} & 0 \end{pmatrix}$

- Kets: dimension = 2

Table 2: Hilbert space for full matrix.

No.	ket	No.	ket
1	$p_z@C_1$	2	$p_z@C_2$

- Sites in (primitive) unit cell:

Table 3: Site-clusters.

	site	position			mapping
S_1 [2c: -6m2]	C_1	$\frac{1}{3}$	$\frac{2}{3}$	0	[1,6,7,8,9,10,14,15,16,17,23,24]
	C_2	$\frac{2}{3}$	$\frac{1}{3}$	0	[2,3,4,5,11,12,13,18,19,20,21,22]

- Bonds in (primitive) unit cell:

Table 4: Bond-clusters.

	bond	tail	head	n	#	$\boldsymbol{b}@\boldsymbol{c}$		mapping
B_1 [3f: mmm]	b_1	C_2	C_1	1	1	$\left(\frac{1}{3}\ \ \frac{2}{3}\ \ 0\right)$ @ $\left(\frac{1}{2}\ \ 0\ \ 0\right)$		[1,-2,-3,6,-13,14,17,-18]
	b_2	C_2	C_1	1	1	$\left(\frac{1}{3}\ \ -\frac{1}{3}\ \ 0\right)$ @ $\left(\frac{1}{2}\ \ \frac{1}{2}\ \ 0\right)$		[-4,7,10,-11,15,-19,-22,23]
	b_3	C_2	C_1	1	1	$\left(-\frac{2}{3}\ \ -\frac{1}{3}\ \ 0\right)$ @ $\left(0\ \ \frac{1}{2}\ \ 0\right)$		[-5,8,9,-12,16,-20,-21,24]
B_2 [6l: mm2]	b_4	C_1	C_1	2	1	$\left(0\ \ 1\ \ 0\right)$ @ $\left(\frac{1}{3}\ \ \frac{1}{6}\ \ 0\right)$		[1,-7,-15,17]
	b_5	C_2	C_2	2	1	$\left(0\ \ 1\ \ 0\right)$ @ $\left(\frac{2}{3}\ \ \frac{5}{6}\ \ 0\right)$		[-2,4,-13,19]
	b_6	C_2	C_2	2	1	$\left(1\ \ 1\ \ 0\right)$ @ $\left(\frac{1}{6}\ \ \frac{5}{6}\ \ 0\right)$		[-3,12,-18,21]
	b_7	C_2	C_2	2	1	$\left(1\ \ 0\ \ 0\right)$ @ $\left(\frac{1}{6}\ \ \frac{1}{3}\ \ 0\right)$		[5,-11,20,-22]
	b_8	C_1	C_1	2	1	$\left(1\ \ 1\ \ 0\right)$ @ $\left(\frac{5}{6}\ \ \frac{1}{6}\ \ 0\right)$		[6,-9,14,-24]
	b_9	C_1	C_1	2	1	$\left(1\ \ 0\ \ 0\right)$ @ $\left(\frac{5}{6}\ \ \frac{2}{3}\ \ 0\right)$		[-8,10,-16,23]
B_3 [1a: 6/mmm]	b_{10}	C_2	C_1	3	1	$\left(\frac{4}{3}\ \ \frac{2}{3}\ \ 0\right)$ @ $\left(0\ \ 0\ \ 0\right)$		[1,-2,-4,7,-13,15,17,-19]

continued ...

2

Table 4

	bond	tail	head	n	#	$\boldsymbol{b}@\boldsymbol{c}$	mapping
	b_{11}	C_2	C_1	3	1	$\left(-\frac{2}{3} \quad \frac{2}{3} \quad 0\right)@\left(0 \quad 0 \quad 0\right)$	[-3,6,9,-12,14,-18,-21,24]
	b_{12}	C_2	C_1	3	1	$\left(-\frac{2}{3} \quad -\frac{4}{3} \quad 0\right)@\left(0 \quad 0 \quad 0\right)$	[-5,8,10,-11,16,-20,-22,23]
B_4 [3f: mmm]	b_{13}	C_2	C_1	4	1	$\left(\frac{4}{3} \quad \frac{5}{3} \quad 0\right)@\left(0 \quad \frac{1}{2} \quad 0\right)$	[1,-2,-13,17]
	b_{14}	C_2	C_1	4	1	$\left(\frac{1}{3} \quad \frac{5}{3} \quad 0\right)@\left(\frac{1}{2} \quad \frac{1}{2} \quad 0\right)$	[-3,6,14,-18]
	b_{15}	C_2	C_1	4	1	$\left(\frac{4}{3} \quad -\frac{1}{3} \quad 0\right)@\left(0 \quad \frac{1}{2} \quad 0\right)$	[-4,7,15,-19]
	b_{16}	C_2	C_1	4	1	$\left(-\frac{5}{3} \quad -\frac{4}{3} \quad 0\right)@\left(\frac{1}{2} \quad 0 \quad 0\right)$	[-5,8,16,-20]
	b_{17}	C_2	C_1	4	1	$\left(-\frac{5}{3} \quad -\frac{1}{3} \quad 0\right)@\left(\frac{1}{2} \quad \frac{1}{2} \quad 0\right)$	[9,-12,-21,24]
	b_{18}	C_2	C_1	4	1	$\left(\frac{1}{3} \quad -\frac{4}{3} \quad 0\right)@\left(\frac{1}{2} \quad 0 \quad 0\right)$	[10,-11,-22,23]
B_5 [6l: mm2]	b_{19}	C_1	C_1	5	1	$\left(1 \quad 2 \quad 0\right)@\left(\frac{5}{6} \quad \frac{2}{3} \quad 0\right)$	[1,6,14,17]
	b_{20}	C_2	C_2	5	1	$\left(-1 \quad -2 \quad 0\right)@\left(\frac{1}{6} \quad \frac{1}{3} \quad 0\right)$	[2,3,13,18]
	b_{21}	C_2	C_2	5	1	$\left(-1 \quad 1 \quad 0\right)@\left(\frac{1}{6} \quad \frac{5}{6} \quad 0\right)$	[4,11,19,22]
	b_{22}	C_2	C_2	5	1	$\left(2 \quad 1 \quad 0\right)@\left(\frac{2}{3} \quad \frac{5}{6} \quad 0\right)$	[5,12,20,21]
	b_{23}	C_1	C_1	5	1	$\left(1 \quad -1 \quad 0\right)@\left(\frac{5}{6} \quad \frac{1}{6} \quad 0\right)$	[7,10,15,23]
	b_{24}	C_1	C_1	5	1	$\left(-2 \quad -1 \quad 0\right)@\left(\frac{1}{3} \quad \frac{1}{6} \quad 0\right)$	[8,9,16,24]
B_6 [2c: -6m2]	b_{25}	C_1	C_1	6	1	$\left(2 \quad 2 \quad 0\right)@\left(\frac{1}{3} \quad \frac{2}{3} \quad 0\right)$	[1,-8,-16,17]
	b_{26}	C_2	C_2	6	1	$\left(2 \quad 2 \quad 0\right)@\left(\frac{2}{3} \quad \frac{1}{3} \quad 0\right)$	[-2,5,-13,20]
	b_{27}	C_2	C_2	6	1	$\left(0 \quad 2 \quad 0\right)@\left(\frac{2}{3} \quad \frac{1}{3} \quad 0\right)$	[-3,11,-18,22]
	b_{28}	C_2	C_2	6	1	$\left(2 \quad 0 \quad 0\right)@\left(\frac{2}{3} \quad \frac{1}{3} \quad 0\right)$	[-4,12,-19,21]
	b_{29}	C_1	C_1	6	1	$\left(0 \quad 2 \quad 0\right)@\left(\frac{1}{3} \quad \frac{2}{3} \quad 0\right)$	[6,-10,14,-23]
	b_{30}	C_1	C_1	6	1	$\left(2 \quad 0 \quad 0\right)@\left(\frac{1}{3} \quad \frac{2}{3} \quad 0\right)$	[7,-9,15,-24]

- SAMB:

No. 1 $\hat{\mathbb{Q}}_0^{(A_{1g})}$ [M_1, S_1]

$\hat{\mathbb{Z}}_1 = \mathbb{X}_1[\mathbb{Q}_0^{(a,A_{1g})}] \otimes \mathbb{Y}_1[\mathbb{Q}_0^{(s,A_{1g})}]$

$\boxed{\text{No. 2}}$ $\hat{\mathbb{Q}}_0^{(A_{1g})}$ $[\text{M}_1, \text{B}_1]$

$\hat{\mathbb{Z}}_2 = \mathbb{X}_1[\mathbb{Q}_0^{(a,A_{1g})}] \otimes \mathbb{Y}_2[\mathbb{Q}_0^{(b,A_{1g})}]$

$\boxed{\text{No. 3}}$ $\hat{\mathbb{Q}}_0^{(A_{1g})}$ $[\text{M}_1, \text{B}_2]$

$\hat{\mathbb{Z}}_3 = \mathbb{X}_1[\mathbb{Q}_0^{(a,A_{1g})}] \otimes \mathbb{Y}_3[\mathbb{Q}_0^{(b,A_{1g})}]$

$\boxed{\text{No. 4}}$ $\hat{\mathbb{Q}}_0^{(A_{1g})}$ $[\text{M}_1, \text{B}_3]$

$\hat{\mathbb{Z}}_4 = \mathbb{X}_1[\mathbb{Q}_0^{(a,A_{1g})}] \otimes \mathbb{Y}_4[\mathbb{Q}_0^{(b,A_{1g})}]$

$\boxed{\text{No. 5}}$ $\hat{\mathbb{Q}}_0^{(A_{1g})}$ $[\text{M}_1, \text{B}_4]$

$\hat{\mathbb{Z}}_5 = \mathbb{X}_1[\mathbb{Q}_0^{(a,A_{1g})}] \otimes \mathbb{Y}_5[\mathbb{Q}_0^{(b,A_{1g})}]$

$\boxed{\text{No. 6}}$ $\hat{\mathbb{Q}}_0^{(A_{1g})}$ $[\text{M}_1, \text{B}_5]$

$\hat{\mathbb{Z}}_6 = \mathbb{X}_1[\mathbb{Q}_0^{(a,A_{1g})}] \otimes \mathbb{Y}_6[\mathbb{Q}_0^{(b,A_{1g})}]$

$\boxed{\text{No. 7}}$ $\hat{\mathbb{Q}}_0^{(A_{1g})}$ $[\text{M}_1, \text{B}_6]$

$\hat{\mathbb{Z}}_7 = \mathbb{X}_1[\mathbb{Q}_0^{(a,A_{1g})}] \otimes \mathbb{Y}_7[\mathbb{Q}_0^{(b,A_{1g})}]$

Table 5: Atomic SAMB group.

group	bra	ket
M_1	p_z	p_z

Table 6: Atomic SAMB.

symbol	type	group	form
$\mathbb{X}_1$	$\mathbb{Q}_0^{(a,A_{1g})}$	M_1	$\begin{pmatrix} 1 \end{pmatrix}$

Table 7: Cluster SAMB.

symbol	type	cluster	form
$\mathbb{Y}_1$	$\mathbb{Q}_0^{(s,A_{1g})}$	S_1	$\begin{pmatrix} \frac{\sqrt{2}}{2} & \frac{\sqrt{2}}{2} \end{pmatrix}$
$\mathbb{Y}_2$	$\mathbb{Q}_0^{(b,A_{1g})}$	B_1	$\begin{pmatrix} \frac{\sqrt{3}}{3} & \frac{\sqrt{3}}{3} & \frac{\sqrt{3}}{3} \end{pmatrix}$
$\mathbb{Y}_3$	$\mathbb{Q}_0^{(b,A_{1g})}$	B_2	$\begin{pmatrix} \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} \end{pmatrix}$
$\mathbb{Y}_4$	$\mathbb{Q}_0^{(b,A_{1g})}$	B_3	$\begin{pmatrix} \frac{\sqrt{3}}{3} & \frac{\sqrt{3}}{3} & \frac{\sqrt{3}}{3} \end{pmatrix}$
$\mathbb{Y}_5$	$\mathbb{Q}_0^{(b,A_{1g})}$	B_4	$\begin{pmatrix} \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} \end{pmatrix}$
$\mathbb{Y}_6$	$\mathbb{Q}_0^{(b,A_{1g})}$	B_5	$\begin{pmatrix} \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} \end{pmatrix}$
$\mathbb{Y}_7$	$\mathbb{Q}_0^{(b,A_{1g})}$	B_6	$\begin{pmatrix} \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}}{6} \end{pmatrix}$

Table 8: Polar harmonics.

No.	symbol	rank	irrep.	mul.	comp.	form
1	$\mathbb{Q}_0^{(A_{1g})}$	0	A_{1g}	$-$	$-$	1

- Group info.: Generator = $\{3_{001}^+|0\}$, $\{2_{001}|0\}$, $\{2_{110}|0\}$, $\{-1|0\}$

Table 9: Conjugacy class (point-group part).

rep. SO	symmetry operations
$\{1|0\}$	$\{1|0\}$
$\{2_{001}|0\}$	$\{2_{001}|0\}$
$\{2_{100}|0\}$	$\{2_{100}|0\}$, $\{2_{010}|0\}$, $\{2_{110}|0\}$
$\{2_{120}|0\}$	$\{2_{120}|0\}$, $\{2_{210}|0\}$, $\{2_{1-10}|0\}$
$\{3_{001}^+|0\}$	$\{3_{001}^+|0\}$, $\{3_{001}^-|0\}$
$\{6_{001}^+|0\}$	$\{6_{001}^+|0\}$, $\{6_{001}^-|0\}$
$\{-1|0\}$	$\{-1|0\}$
$\{m_{100}|0\}$	$\{m_{100}|0\}$, $\{m_{010}|0\}$, $\{m_{110}|0\}$
$\{m_{001}|0\}$	$\{m_{001}|0\}$
$\{m_{120}|0\}$	$\{m_{120}|0\}$, $\{m_{210}|0\}$, $\{m_{1-10}|0\}$
$\{-3_{001}^+|0\}$	$\{-3_{001}^+|0\}$, $\{-3_{001}^-|0\}$
$\{-6_{001}^+|0\}$	$\{-6_{001}^+|0\}$, $\{-6_{001}^-|0\}$

Table 10: Symmetry operations.

No.	SO	No.	SO	No.	SO	No.	SO	No.	SO
1	$\{1|0\}$	2	$\{2_{001}|0\}$	3	$\{2_{100}|0\}$	4	$\{2_{010}|0\}$	5	$\{2_{110}|0\}$
6	$\{2_{120}|0\}$	7	$\{2_{210}|0\}$	8	$\{2_{1-10}|0\}$	9	$\{3_{001}^+|0\}$	10	$\{3_{001}^-|0\}$
11	$\{6_{001}^+|0\}$	12	$\{6_{001}^-|0\}$	13	$\{-1|0\}$	14	$\{m_{100}|0\}$	15	$\{m_{010}|0\}$
16	$\{m_{110}|0\}$	17	$\{m_{001}|0\}$	18	$\{m_{120}|0\}$	19	$\{m_{210}|0\}$	20	$\{m_{1-10}|0\}$
21	$\{-3_{001}^+|0\}$	22	$\{-3_{001}^-|0\}$	23	$\{-6_{001}^+|0\}$	24	$\{-6_{001}^-|0\}$		

Table 11: Character table (point-group part).

	1	2_{001}	2_{100}	2_{120}	3_{001}^+	6_{001}^+	-1	m_{100}	m_{001}	m_{120}	-3_{001}^+	-6_{001}^+
A_{1g}	1	1	1	1	1	1	1	1	1	1	1	1

Table 11

	1	2_{001}	2_{100}	2_{120}	3^+_{001}	6^+_{001}	-1	m_{100}	m_{001}	m_{120}	-3^+_{001}	-6^+_{001}
A_{2g}	1	1	-1	-1	1	1	1	-1	1	-1	1	1
B_{1g}	1	-1	-1	1	1	-1	1	-1	-1	1	1	-1
B_{2g}	1	-1	1	-1	1	-1	1	1	-1	-1	1	-1
E_{1g}	2	-2	0	0	-1	1	2	0	-2	0	-1	1
E_{2g}	2	2	0	0	-1	-1	2	0	2	0	-1	-1
A_{1u}	1	1	1	1	1	1	-1	-1	-1	-1	-1	-1
A_{2u}	1	1	-1	-1	1	1	-1	1	-1	1	-1	-1
B_{1u}	1	-1	-1	1	1	-1	-1	1	1	-1	-1	1
B_{2u}	1	-1	1	-1	1	-1	-1	-1	1	1	-1	1
E_{1u}	2	-2	0	0	-1	1	-2	0	2	0	1	-1
E_{2u}	2	2	0	0	-1	-1	-2	0	-2	0	1	1

Table 12: Parity conversion.

$\leftrightarrow$	$\leftrightarrow$	$\leftrightarrow$	$\leftrightarrow$	$\leftrightarrow$
A_{1g} (A_{1u})	A_{2g} (A_{2u})	B_{1g} (B_{1u})	B_{2g} (B_{2u})	E_{1g} (E_{1u})
E_{2g} (E_{2u})	A_{1u} (A_{1g})	A_{2u} (A_{2g})	B_{1u} (B_{1g})	B_{2u} (B_{2g})
E_{1u} (E_{1g})	E_{2u} (E_{2g})			

Table 13: Symmetric product, $[\Gamma \otimes \Gamma']_+$.

	A_{1g}	A_{2g}	B_{1g}	B_{2g}	E_{1g}	E_{2g}	A_{1u}	A_{2u}	B_{1u}	B_{2u}	E_{1u}	E_{2u}
A_{1g}	A_{1g}	A_{2g}	B_{1g}	B_{2g}	E_{1g}	E_{2g}	A_{1u}	A_{2u}	B_{1u}	B_{2u}	E_{1u}	E_{2u}
A_{2g}		A_{1g}	B_{2g}	B_{1g}	E_{1g}	E_{2g}	A_{2u}	A_{1u}	B_{2u}	B_{1u}	E_{1u}	E_{2u}
B_{1g}			A_{1g}	A_{2g}	E_{2g}	E_{1g}	B_{1u}	B_{2u}	A_{1u}	A_{2u}	E_{2u}	E_{1u}
B_{2g}				A_{1g}	E_{2g}	E_{1g}	B_{2u}	B_{1u}	A_{2u}	A_{1u}	E_{2u}	E_{1u}
E_{1g}					$A_{1g}+E_{2g}$	$B_{1g}+B_{2g}+E_{1g}$	E_{1u}	E_{1u}	E_{2u}	E_{2u}	$A_{1u}+A_{2u}+E_{2u}$	$B_{1u}+B_{2u}+E_{1u}$
E_{2g}						$A_{1g}+E_{2g}$	E_{2u}	E_{2u}	E_{1u}	E_{1u}	$B_{1u}+B_{2u}+E_{1u}$	$A_{1u}+A_{2u}+E_{2u}$
A_{1u}							A_{1g}	A_{2g}	B_{1g}	B_{2g}	E_{1g}	E_{2g}
A_{2u}								A_{1g}	B_{2g}	B_{1g}	E_{1g}	E_{2g}
B_{1u}									A_{1g}	A_{2g}	E_{2g}	E_{1g}
B_{2u}										A_{1g}	E_{2g}	E_{1g}
E_{1u}											$A_{1g}+E_{2g}$	$B_{1g}+B_{2g}+E_{1g}$
E_{2u}												$A_{1g}+E_{2g}$

7

Table 14: Anti-symmetric product, $[\Gamma \otimes \Gamma]_-$.

A_{1g}	A_{2g}	B_{1g}	B_{2g}	E_{1g}	E_{2g}	A_{1u}	A_{2u}	B_{1u}	B_{2u}	E_{1u}	E_{2u}
−	−	−	−	A_{2g}	A_{2g}	−	−	−	−	A_{2g}	A_{2g}

Table 15: Virtual-cluster sites.

No.	position	No.	position	No.	position	No.	position
1	$\left(1+\sqrt{3} \quad -1+\sqrt{3} \quad 1\right)$	2	$\left(-\sqrt{3}-1 \quad 1-\sqrt{3} \quad 1\right)$	3	$\left(2 \quad 1-\sqrt{3} \quad -1\right)$	4	$\left(-\sqrt{3}-1 \quad -2 \quad -1\right)$
5	$\left(-1+\sqrt{3} \quad 1+\sqrt{3} \quad -1\right)$	6	$\left(-2 \quad -1+\sqrt{3} \quad -1\right)$	7	$\left(1+\sqrt{3} \quad 2 \quad -1\right)$	8	$\left(1-\sqrt{3} \quad -\sqrt{3}-1 \quad -1\right)$
9	$\left(1-\sqrt{3} \quad 2 \quad 1\right)$	10	$\left(-2 \quad -\sqrt{3}-1 \quad 1\right)$	11	$\left(2 \quad 1+\sqrt{3} \quad 1\right)$	12	$\left(-1+\sqrt{3} \quad -2 \quad 1\right)$
13	$\left(-\sqrt{3}-1 \quad 1-\sqrt{3} \quad -1\right)$	14	$\left(-2 \quad -1+\sqrt{3} \quad 1\right)$	15	$\left(1+\sqrt{3} \quad 2 \quad 1\right)$	16	$\left(1-\sqrt{3} \quad -\sqrt{3}-1 \quad 1\right)$
17	$\left(1+\sqrt{3} \quad -1+\sqrt{3} \quad -1\right)$	18	$\left(2 \quad 1-\sqrt{3} \quad 1\right)$	19	$\left(-\sqrt{3}-1 \quad -2 \quad 1\right)$	20	$\left(-1+\sqrt{3} \quad 1+\sqrt{3} \quad 1\right)$
21	$\left(-1+\sqrt{3} \quad -2 \quad -1\right)$	22	$\left(2 \quad 1+\sqrt{3} \quad -1\right)$	23	$\left(-2 \quad -\sqrt{3}-1 \quad -1\right)$	24	$\left(1-\sqrt{3} \quad 2 \quad -1\right)$

Table 16: Virtual-cluster basis.

symbol	1	2	3	4	5	6	7	8	9	10
$\mathbb{Q}_0^{(A_{1g})}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_1^{(A_{2u})}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$						

Table 16

symbol	1	2	3	4	5	6	7	8	9	10
$\mathbb{Q}_{1,0}^{(E_{1u})}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$
	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$
	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{1,1}^{(E_{1u})}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$
	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$
	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{2,0}^{(E_{1g})}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$
	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$
	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{2,1}^{(E_{1g})}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$
	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$
	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{2,0}^{(E_{2g})}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	0	$-\frac{1}{4}$	$\frac{1}{4}$	0	$-\frac{1}{4}$	0	$-\frac{1}{4}$
	$-\frac{1}{4}$	0	$\frac{1}{4}$	$\frac{1}{4}$	0	$-\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	0	$-\frac{1}{4}$
	0	$-\frac{1}{4}$	$-\frac{1}{4}$	0						
$\mathbb{Q}_{2,1}^{(E_{2g})}$	$-\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{6}$	$-\frac{\sqrt{3}}{12}$
	$-\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{6}$	$-\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$
	$\frac{\sqrt{3}}{6}$	$-\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{6}$						
$\mathbb{Q}_{3}^{(B_{1u})}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$
	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{3}^{(B_{2u})}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{3,0}^{(E_{2u})}$	$\frac{1}{4}$	$\frac{1}{4}$	$-\frac{1}{4}$	0	$\frac{1}{4}$	$-\frac{1}{4}$	0	$\frac{1}{4}$	0	$-\frac{1}{4}$
	$-\frac{1}{4}$	0	$-\frac{1}{4}$	$\frac{1}{4}$	0	$-\frac{1}{4}$	$-\frac{1}{4}$	$\frac{1}{4}$	0	$-\frac{1}{4}$
	0	$\frac{1}{4}$	$\frac{1}{4}$	0						
$\mathbb{Q}_{3,1}^{(E_{2u})}$	$-\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{6}$	$-\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{6}$	$-\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{6}$	$-\frac{\sqrt{3}}{12}$
	$-\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$

Table 16

symbol	1	2	3	4	5	6	7	8	9	10
	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$						
$\mathbb{Q}_4^{(B_{1g})}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_4^{(B_{2g})}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{4,0}^{(E_{2g},1)}$	$\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$
	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$
	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$						
$\mathbb{Q}_{4,1}^{(E_{2g},1)}$	$\frac{1}{4}$	$\frac{1}{4}$	$-\frac{1}{4}$	0	$\frac{1}{4}$	$-\frac{1}{4}$	0	$\frac{1}{4}$	0	$-\frac{1}{4}$
	$-\frac{1}{4}$	0	$\frac{1}{4}$	$-\frac{1}{4}$	0	$\frac{1}{4}$	$\frac{1}{4}$	$-\frac{1}{4}$	0	$\frac{1}{4}$
	0	$-\frac{1}{4}$	$-\frac{1}{4}$	0						
$\mathbb{Q}_{5,0}^{(E_{1u},1)}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$
	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$
	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{5,1}^{(E_{1u},1)}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$
	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$
	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{5,0}^{(E_{2u},1)}$	$\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{6}$	$-\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{6}$	$-\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$
	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$-\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{6}$	$\frac{\sqrt{3}}{12}$
	$\frac{\sqrt{3}}{6}$	$-\frac{\sqrt{3}}{12}$	$-\frac{\sqrt{3}}{12}$	$\frac{\sqrt{3}}{6}$						
$\mathbb{Q}_{5,1}^{(E_{2u},1)}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	0	$-\frac{1}{4}$	$\frac{1}{4}$	0	$-\frac{1}{4}$	0	$-\frac{1}{4}$
	$-\frac{1}{4}$	0	$-\frac{1}{4}$	$-\frac{1}{4}$	0	$\frac{1}{4}$	$-\frac{1}{4}$	$-\frac{1}{4}$	0	$\frac{1}{4}$
	0	$\frac{1}{4}$	$\frac{1}{4}$	0						
$\mathbb{Q}_6^{(A_{2g})}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{6,0}^{(E_{1g},1)}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$

Table 16

symbol	1	2	3	4	5	6	7	8	9	10
	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$
	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{6,1}^{(E_{1g},1)}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$
	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{2}}{8}-\frac{\sqrt{6}}{24}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$
	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{24}+\frac{\sqrt{2}}{8}$	$-\frac{\sqrt{2}}{8}+\frac{\sqrt{6}}{24}$	$-\frac{\sqrt{6}}{12}$						
$\mathbb{Q}_{7}^{(A_{1u})}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$
	$\frac{\sqrt{6}}{12}$	$\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$
	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$	$-\frac{\sqrt{6}}{12}$						