

No. 19  $C_{3v} - 1$   $31m$  (31m setting) [ trigonal ] (axial)

表 1 rank 0

No.	irrep.	(tag)	mul.	comp.	harmonics	(tag)	definition
1	$A_2$	A2	—	—	$\mathbb{G}_0^{(h,A_2)}$	Gh(0, A2, , )	$C_0$

表 2 rank 1

No.	irrep.	(tag)	mul.	comp.	harmonics	(tag)	definition
2	$A_2$	A2	—	—	$\mathbb{G}_1^{(h,A_2)}$	Gh(1, A2, , )	$C_0$
3	$E$	E	—	0	$\mathbb{G}_{1,0}^{(h,E)}$	Gh(1, E, , 0)	$-S_1$
4	$E$	E	—	1	$\mathbb{G}_{1,1}^{(h,E)}$	Gh(1, E, , 1)	$C_1$

表 3 rank 2

No.	irrep.	(tag)	mul.	comp.	harmonics	(tag)	definition
5	$A_2$	A2	—	—	$\mathbb{G}_2^{(h,A_2)}$	Gh(2, A2, , )	$C_0$
6	$E$	E	1	0	$\mathbb{G}_{2,0}^{(h,E,1)}$	Gh(2, E, 1, 0)	$-S_1$
7	$E$	E	1	1	$\mathbb{G}_{2,1}^{(h,E,1)}$	Gh(2, E, 1, 1)	$C_1$
8	$E$	E	2	0	$\mathbb{G}_{2,0}^{(h,E,2)}$	Gh(2, E, 2, 0)	$S_2$
9	$E$	E	2	1	$\mathbb{G}_{2,1}^{(h,E,2)}$	Gh(2, E, 2, 1)	$C_2$

表 4 rank 3

No.	irrep.	(tag)	mul.	comp.	harmonics	(tag)	definition
10	$A_1$	A1	—	—	$\mathbb{G}_3^{(h,A_1)}$	Gh(3, A1, , )	$S_3$
11	$A_2$	A2	1	—	$\mathbb{G}_3^{(h,A_2,1)}$	Gh(3, A2, 1, )	$C_0$
12	$A_2$	A2	2	—	$\mathbb{G}_3^{(h,A_2,2)}$	Gh(3, A2, 2, )	$C_3$
13	$E$	E	1	0	$\mathbb{G}_{3,0}^{(h,E,1)}$	Gh(3, E, 1, 0)	$-S_1$
14	$E$	E	1	1	$\mathbb{G}_{3,1}^{(h,E,1)}$	Gh(3, E, 1, 1)	$C_1$
15	$E$	E	2	0	$\mathbb{G}_{3,0}^{(h,E,2)}$	Gh(3, E, 2, 0)	$S_2$
16	$E$	E	2	1	$\mathbb{G}_{3,1}^{(h,E,2)}$	Gh(3, E, 2, 1)	$C_2$

表 5 rank 4

No.	irrep.	(tag)	mul.	comp.	harmonics	(tag)	definition
17	$A_1$	A1	—	—	$\mathbb{G}_4^{(h,A_1)}$	Gh(4, A1, , )	$S_3$
18	$A_2$	A2	1	—	$\mathbb{G}_4^{(h,A_2,1)}$	Gh(4, A2, 1, )	$C_0$
19	$A_2$	A2	2	—	$\mathbb{G}_4^{(h,A_2,2)}$	Gh(4, A2, 2, )	$C_3$
20	$E$	E	1	0	$\mathbb{G}_{4,0}^{(h,E,1)}$	Gh(4, E, 1, 0)	$-S_1$
21	$E$	E	1	1	$\mathbb{G}_{4,1}^{(h,E,1)}$	Gh(4, E, 1, 1)	$C_1$
22	$E$	E	2	0	$\mathbb{G}_{4,0}^{(h,E,2)}$	Gh(4, E, 2, 0)	$-S_4$
23	$E$	E	2	1	$\mathbb{G}_{4,1}^{(h,E,2)}$	Gh(4, E, 2, 1)	$C_4$
24	$E$	E	3	0	$\mathbb{G}_{4,0}^{(h,E,3)}$	Gh(4, E, 3, 0)	$S_2$
25	$E$	E	3	1	$\mathbb{G}_{4,1}^{(h,E,3)}$	Gh(4, E, 3, 1)	$C_2$

表 6 rank 5

No.	irrep.	(tag)	mul.	comp.	harmonics	(tag)	definition
26	$A_1$	A1	—	—	$\mathbb{G}_5^{(h,A_1)}$	Gh(5, A1, , )	$S_3$
27	$A_2$	A2	1	—	$\mathbb{G}_5^{(h,A_2,1)}$	Gh(5, A2, 1, )	$C_0$
28	$A_2$	A2	2	—	$\mathbb{G}_5^{(h,A_2,2)}$	Gh(5, A2, 2, )	$C_3$
29	$E$	E	1	0	$\mathbb{G}_{5,0}^{(h,E,1)}$	Gh(5, E, 1, 0)	$S_5$
30	$E$	E	1	1	$\mathbb{G}_{5,1}^{(h,E,1)}$	Gh(5, E, 1, 1)	$C_5$
31	$E$	E	2	0	$\mathbb{G}_{5,0}^{(h,E,2)}$	Gh(5, E, 2, 0)	$-S_1$
32	$E$	E	2	1	$\mathbb{G}_{5,1}^{(h,E,2)}$	Gh(5, E, 2, 1)	$C_1$
33	$E$	E	3	0	$\mathbb{G}_{5,0}^{(h,E,3)}$	Gh(5, E, 3, 0)	$-S_4$
34	$E$	E	3	1	$\mathbb{G}_{5,1}^{(h,E,3)}$	Gh(5, E, 3, 1)	$C_4$
35	$E$	E	4	0	$\mathbb{G}_{5,0}^{(h,E,4)}$	Gh(5, E, 4, 0)	$S_2$
36	$E$	E	4	1	$\mathbb{G}_{5,1}^{(h,E,4)}$	Gh(5, E, 4, 1)	$C_2$

表 7 rank 6

No.	irrep.	(tag)	mul.	comp.	harmonics	(tag)	definition
37	$A_1$	A1	1	—	$\mathbb{G}_6^{(h,A_1,1)}$	Gh(6, A1, 1, )	$S_6$
38	$A_1$	A1	2	—	$\mathbb{G}_6^{(h,A_1,2)}$	Gh(6, A1, 2, )	$S_3$
39	$A_2$	A2	1	—	$\mathbb{G}_6^{(h,A_2,1)}$	Gh(6, A2, 1, )	$C_0$
40	$A_2$	A2	2	—	$\mathbb{G}_6^{(h,A_2,2)}$	Gh(6, A2, 2, )	$C_6$
41	$A_2$	A2	3	—	$\mathbb{G}_6^{(h,A_2,3)}$	Gh(6, A2, 3, )	$C_3$
42	$E$	E	1	0	$\mathbb{G}_{6,0}^{(h,E,1)}$	Gh(6, E, 1, 0)	$S_5$
43	$E$	E	1	1	$\mathbb{G}_{6,1}^{(h,E,1)}$	Gh(6, E, 1, 1)	$C_5$
44	$E$	E	2	0	$\mathbb{G}_{6,0}^{(h,E,2)}$	Gh(6, E, 2, 0)	$-S_1$
45	$E$	E	2	1	$\mathbb{G}_{6,1}^{(h,E,2)}$	Gh(6, E, 2, 1)	$C_1$
46	$E$	E	3	0	$\mathbb{G}_{6,0}^{(h,E,3)}$	Gh(6, E, 3, 0)	$-S_4$
47	$E$	E	3	1	$\mathbb{G}_{6,1}^{(h,E,3)}$	Gh(6, E, 3, 1)	$C_4$
48	$E$	E	4	0	$\mathbb{G}_{6,0}^{(h,E,4)}$	Gh(6, E, 4, 0)	$S_2$
49	$E$	E	4	1	$\mathbb{G}_{6,1}^{(h,E,4)}$	Gh(6, E, 4, 1)	$C_2$

表 8 rank 7

No.	irrep.	(tag)	mul.	comp.	harmonics	(tag)	definition
50	$A_1$	A1	1	—	$\mathbb{G}_7^{(h,A_1,1)}$	Gh(7, A1, 1, )	$S_6$
51	$A_1$	A1	2	—	$\mathbb{G}_7^{(h,A_1,2)}$	Gh(7, A1, 2, )	$S_3$
52	$A_2$	A2	1	—	$\mathbb{G}_7^{(h,A_2,1)}$	Gh(7, A2, 1, )	$C_0$
53	$A_2$	A2	2	—	$\mathbb{G}_7^{(h,A_2,2)}$	Gh(7, A2, 2, )	$C_6$
54	$A_2$	A2	3	—	$\mathbb{G}_7^{(h,A_2,3)}$	Gh(7, A2, 3, )	$C_3$
55	$E$	E	1	0	$\mathbb{G}_{7,0}^{(h,E,1)}$	Gh(7, E, 1, 0)	$-S_7$
56	$E$	E	1	1	$\mathbb{G}_{7,1}^{(h,E,1)}$	Gh(7, E, 1, 1)	$C_7$
57	$E$	E	2	0	$\mathbb{G}_{7,0}^{(h,E,2)}$	Gh(7, E, 2, 0)	$S_5$
58	$E$	E	2	1	$\mathbb{G}_{7,1}^{(h,E,2)}$	Gh(7, E, 2, 1)	$C_5$
59	$E$	E	3	0	$\mathbb{G}_{7,0}^{(h,E,3)}$	Gh(7, E, 3, 0)	$-S_1$
60	$E$	E	3	1	$\mathbb{G}_{7,1}^{(h,E,3)}$	Gh(7, E, 3, 1)	$C_1$
61	$E$	E	4	0	$\mathbb{G}_{7,0}^{(h,E,4)}$	Gh(7, E, 4, 0)	$-S_4$
62	$E$	E	4	1	$\mathbb{G}_{7,1}^{(h,E,4)}$	Gh(7, E, 4, 1)	$C_4$
63	$E$	E	5	0	$\mathbb{G}_{7,0}^{(h,E,5)}$	Gh(7, E, 5, 0)	$S_2$
64	$E$	E	5	1	$\mathbb{G}_{7,1}^{(h,E,5)}$	Gh(7, E, 5, 1)	$C_2$

表 9 rank 8

No.	irrep.	(tag)	mul.	comp.	harmonics	(tag)	definition
65	$A_1$	A1	1	—	$\mathbb{G}_8^{(h,A_1,1)}$	Gh(8, A1, 1, )	$S_6$
66	$A_1$	A1	2	—	$\mathbb{G}_8^{(h,A_1,2)}$	Gh(8, A1, 2, )	$S_3$
67	$A_2$	A2	1	—	$\mathbb{G}_8^{(h,A_2,1)}$	Gh(8, A2, 1, )	$C_0$
68	$A_2$	A2	2	—	$\mathbb{G}_8^{(h,A_2,2)}$	Gh(8, A2, 2, )	$C_6$
69	$A_2$	A2	3	—	$\mathbb{G}_8^{(h,A_2,3)}$	Gh(8, A2, 3, )	$C_3$
70	$E$	E	1	0	$\mathbb{G}_{8,0}^{(h,E,1)}$	Gh(8, E, 1, 0)	$-S_7$
71	$E$	E	1	1	$\mathbb{G}_{8,1}^{(h,E,1)}$	Gh(8, E, 1, 1)	$C_7$
72	$E$	E	2	0	$\mathbb{G}_{8,0}^{(h,E,2)}$	Gh(8, E, 2, 0)	$S_5$
73	$E$	E	2	1	$\mathbb{G}_{8,1}^{(h,E,2)}$	Gh(8, E, 2, 1)	$C_5$
74	$E$	E	3	0	$\mathbb{G}_{8,0}^{(h,E,3)}$	Gh(8, E, 3, 0)	$-S_1$
75	$E$	E	3	1	$\mathbb{G}_{8,1}^{(h,E,3)}$	Gh(8, E, 3, 1)	$C_1$
76	$E$	E	4	0	$\mathbb{G}_{8,0}^{(h,E,4)}$	Gh(8, E, 4, 0)	$S_8$
77	$E$	E	4	1	$\mathbb{G}_{8,1}^{(h,E,4)}$	Gh(8, E, 4, 1)	$C_8$
78	$E$	E	5	0	$\mathbb{G}_{8,0}^{(h,E,5)}$	Gh(8, E, 5, 0)	$-S_4$
79	$E$	E	5	1	$\mathbb{G}_{8,1}^{(h,E,5)}$	Gh(8, E, 5, 1)	$C_4$
80	$E$	E	6	0	$\mathbb{G}_{8,0}^{(h,E,6)}$	Gh(8, E, 6, 0)	$S_2$
81	$E$	E	6	1	$\mathbb{G}_{8,1}^{(h,E,6)}$	Gh(8, E, 6, 1)	$C_2$

表 10 rank 9

No.	irrep.	(tag)	mul.	comp.	harmonics	(tag)	definition
82	$A_1$	A1	1	—	$\mathbb{G}_9^{(h,A_1,1)}$	Gh(9, A1, 1, )	$S_6$
83	$A_1$	A1	2	—	$\mathbb{G}_9^{(h,A_1,2)}$	Gh(9, A1, 2, )	$S_9$
84	$A_1$	A1	3	—	$\mathbb{G}_9^{(h,A_1,3)}$	Gh(9, A1, 3, )	$S_3$
85	$A_2$	A2	1	—	$\mathbb{G}_9^{(h,A_2,1)}$	Gh(9, A2, 1, )	$C_0$
86	$A_2$	A2	2	—	$\mathbb{G}_9^{(h,A_2,2)}$	Gh(9, A2, 2, )	$C_6$
87	$A_2$	A2	3	—	$\mathbb{G}_9^{(h,A_2,3)}$	Gh(9, A2, 3, )	$C_9$
88	$A_2$	A2	4	—	$\mathbb{G}_9^{(h,A_2,4)}$	Gh(9, A2, 4, )	$C_3$
89	$E$	E	1	0	$\mathbb{G}_{9,0}^{(h,E,1)}$	Gh(9, E, 1, 0)	$-S_7$
90	$E$	E	1	1	$\mathbb{G}_{9,1}^{(h,E,1)}$	Gh(9, E, 1, 1)	$C_7$
91	$E$	E	2	0	$\mathbb{G}_{9,0}^{(h,E,2)}$	Gh(9, E, 2, 0)	$S_5$
92	$E$	E	2	1	$\mathbb{G}_{9,1}^{(h,E,2)}$	Gh(9, E, 2, 1)	$C_5$
93	$E$	E	3	0	$\mathbb{G}_{9,0}^{(h,E,3)}$	Gh(9, E, 3, 0)	$-S_1$
94	$E$	E	3	1	$\mathbb{G}_{9,1}^{(h,E,3)}$	Gh(9, E, 3, 1)	$C_1$
95	$E$	E	4	0	$\mathbb{G}_{9,0}^{(h,E,4)}$	Gh(9, E, 4, 0)	$S_8$
96	$E$	E	4	1	$\mathbb{G}_{9,1}^{(h,E,4)}$	Gh(9, E, 4, 1)	$C_8$
97	$E$	E	5	0	$\mathbb{G}_{9,0}^{(h,E,5)}$	Gh(9, E, 5, 0)	$-S_4$
98	$E$	E	5	1	$\mathbb{G}_{9,1}^{(h,E,5)}$	Gh(9, E, 5, 1)	$C_4$
99	$E$	E	6	0	$\mathbb{G}_{9,0}^{(h,E,6)}$	Gh(9, E, 6, 0)	$S_2$
100	$E$	E	6	1	$\mathbb{G}_{9,1}^{(h,E,6)}$	Gh(9, E, 6, 1)	$C_2$

表 11 rank 10

No.	irrep.	(tag)	mul.	comp.	harmonics	(tag)	definition
101	$A_1$	A1	1	—	$\mathbb{G}_{10}^{(h,A_1,1)}$	Gh(10, A1, 1, )	$S_6$
102	$A_1$	A1	2	—	$\mathbb{G}_{10}^{(h,A_1,2)}$	Gh(10, A1, 2, )	$S_9$
103	$A_1$	A1	3	—	$\mathbb{G}_{10}^{(h,A_1,3)}$	Gh(10, A1, 3, )	$S_3$
104	$A_2$	A2	1	—	$\mathbb{G}_{10}^{(h,A_2,1)}$	Gh(10, A2, 1, )	$C_0$
105	$A_2$	A2	2	—	$\mathbb{G}_{10}^{(h,A_2,2)}$	Gh(10, A2, 2, )	$C_6$
106	$A_2$	A2	3	—	$\mathbb{G}_{10}^{(h,A_2,3)}$	Gh(10, A2, 3, )	$C_9$
107	$A_2$	A2	4	—	$\mathbb{G}_{10}^{(h,A_2,4)}$	Gh(10, A2, 4, )	$C_3$
108	$E$	E	1	0	$\mathbb{G}_{10,0}^{(h,E,1)}$	Gh(10, E, 1, 0)	$-S_7$
109	$E$	E	1	1	$\mathbb{G}_{10,1}^{(h,E,1)}$	Gh(10, E, 1, 1)	$C_7$
110	$E$	E	2	0	$\mathbb{G}_{10,0}^{(h,E,2)}$	Gh(10, E, 2, 0)	$S_5$
111	$E$	E	2	1	$\mathbb{G}_{10,1}^{(h,E,2)}$	Gh(10, E, 2, 1)	$C_5$
112	$E$	E	3	0	$\mathbb{G}_{10,0}^{(h,E,3)}$	Gh(10, E, 3, 0)	$-S_1$
113	$E$	E	3	1	$\mathbb{G}_{10,1}^{(h,E,3)}$	Gh(10, E, 3, 1)	$C_1$
114	$E$	E	4	0	$\mathbb{G}_{10,0}^{(h,E,4)}$	Gh(10, E, 4, 0)	$-S_{10}$
115	$E$	E	4	1	$\mathbb{G}_{10,1}^{(h,E,4)}$	Gh(10, E, 4, 1)	$C_{10}$
116	$E$	E	5	0	$\mathbb{G}_{10,0}^{(h,E,5)}$	Gh(10, E, 5, 0)	$S_8$
117	$E$	E	5	1	$\mathbb{G}_{10,1}^{(h,E,5)}$	Gh(10, E, 5, 1)	$C_8$
118	$E$	E	6	0	$\mathbb{G}_{10,0}^{(h,E,6)}$	Gh(10, E, 6, 0)	$-S_4$
119	$E$	E	6	1	$\mathbb{G}_{10,1}^{(h,E,6)}$	Gh(10, E, 6, 1)	$C_4$
120	$E$	E	7	0	$\mathbb{G}_{10,0}^{(h,E,7)}$	Gh(10, E, 7, 0)	$S_2$
121	$E$	E	7	1	$\mathbb{G}_{10,1}^{(h,E,7)}$	Gh(10, E, 7, 1)	$C_2$

表 12 rank 11

No.	irrep.	(tag)	mul.	comp.	harmonics	(tag)	definition
122	$A_1$	A1	1	—	$\mathbb{G}_{11}^{(h,A_1,1)}$	Gh(11, A1, 1, )	$S_6$
123	$A_1$	A1	2	—	$\mathbb{G}_{11}^{(h,A_1,2)}$	Gh(11, A1, 2, )	$S_9$
124	$A_1$	A1	3	—	$\mathbb{G}_{11}^{(h,A_1,3)}$	Gh(11, A1, 3, )	$S_3$
125	$A_2$	A2	1	—	$\mathbb{G}_{11}^{(h,A_2,1)}$	Gh(11, A2, 1, )	$C_0$
126	$A_2$	A2	2	—	$\mathbb{G}_{11}^{(h,A_2,2)}$	Gh(11, A2, 2, )	$C_6$
127	$A_2$	A2	3	—	$\mathbb{G}_{11}^{(h,A_2,3)}$	Gh(11, A2, 3, )	$C_9$
128	$A_2$	A2	4	—	$\mathbb{G}_{11}^{(h,A_2,4)}$	Gh(11, A2, 4, )	$C_3$
129	$E$	E	1	0	$\mathbb{G}_{11,0}^{(h,E,1)}$	Gh(11, E, 1, 0)	$S_{11}$
130	$E$	E	1	1	$\mathbb{G}_{11,1}^{(h,E,1)}$	Gh(11, E, 1, 1)	$C_{11}$
131	$E$	E	2	0	$\mathbb{G}_{11,0}^{(h,E,2)}$	Gh(11, E, 2, 0)	$-S_7$
132	$E$	E	2	1	$\mathbb{G}_{11,1}^{(h,E,2)}$	Gh(11, E, 2, 1)	$C_7$
133	$E$	E	3	0	$\mathbb{G}_{11,0}^{(h,E,3)}$	Gh(11, E, 3, 0)	$S_5$
134	$E$	E	3	1	$\mathbb{G}_{11,1}^{(h,E,3)}$	Gh(11, E, 3, 1)	$C_5$
135	$E$	E	4	0	$\mathbb{G}_{11,0}^{(h,E,4)}$	Gh(11, E, 4, 0)	$-S_1$
136	$E$	E	4	1	$\mathbb{G}_{11,1}^{(h,E,4)}$	Gh(11, E, 4, 1)	$C_1$
137	$E$	E	5	0	$\mathbb{G}_{11,0}^{(h,E,5)}$	Gh(11, E, 5, 0)	$-S_{10}$
138	$E$	E	5	1	$\mathbb{G}_{11,1}^{(h,E,5)}$	Gh(11, E, 5, 1)	$C_{10}$
139	$E$	E	6	0	$\mathbb{G}_{11,0}^{(h,E,6)}$	Gh(11, E, 6, 0)	$S_8$
140	$E$	E	6	1	$\mathbb{G}_{11,1}^{(h,E,6)}$	Gh(11, E, 6, 1)	$C_8$
141	$E$	E	7	0	$\mathbb{G}_{11,0}^{(h,E,7)}$	Gh(11, E, 7, 0)	$-S_4$
142	$E$	E	7	1	$\mathbb{G}_{11,1}^{(h,E,7)}$	Gh(11, E, 7, 1)	$C_4$
143	$E$	E	8	0	$\mathbb{G}_{11,0}^{(h,E,8)}$	Gh(11, E, 8, 0)	$S_2$
144	$E$	E	8	1	$\mathbb{G}_{11,1}^{(h,E,8)}$	Gh(11, E, 8, 1)	$C_2$