

1. GENERAL RELATIONSHIPS AND TECHNIQUES

Table A1.4.2.1. *Explicit symbols*

No.	Short Hermann–Mauguin symbol	Comments	Explicit symbols	No.	Short Hermann–Mauguin symbol	Comments	Explicit symbols
1	<i>P</i> 1		PAN\$P1A000	15	<i>C</i> 2/ <i>c</i>	<i>B</i> 112/ <i>n</i>	BMC\$I1A000\$P2C660
2	\bar{P} 1		PAC\$I1A000	15	<i>C</i> 2/ <i>c</i>	<i>I</i> 112/ <i>b</i>	IMC\$I1A000\$P2C060
3	<i>P</i> 2	<i>P</i> 121	PMN\$P2B000	16	<i>P</i> 222		PON\$P2C000\$P2A000
3	<i>P</i> 2	<i>P</i> 112	PMN\$P2C000	17	<i>P</i> 222 ₁		PON\$P2C006\$P2A000
4	<i>P</i> 2 ₁	<i>P</i> 12 ₁ 1	PMN\$P2B060	18	<i>P</i> 2 ₁ 2 ₁ 2		PON\$P2C000\$P2A660
4	<i>P</i> 2 ₁	<i>P</i> 112 ₁	PMN\$P2C006	19	<i>P</i> 2 ₁ 2 ₁ 2 ₁		PON\$P2C606\$P2A660
5	<i>C</i> 2	<i>C</i> 121	CMN\$P2B000	20	<i>C</i> 222 ₁		CON\$P2C006\$P2A000
5	<i>C</i> 2	<i>A</i> 121	AMN\$P2B000	21	<i>C</i> 222		CON\$P2C000\$P2A000
5	<i>C</i> 2	<i>I</i> 121	IMN\$P2B000	22	<i>F</i> 222		FON\$P2C000\$P2A000
5	<i>C</i> 2	<i>A</i> 112	AMN\$P2C000	23	<i>I</i> 222		ION\$P2C000\$P2A000
5	<i>C</i> 2	<i>B</i> 112	BMN\$P2C000	24	<i>I</i> 2 ₁ 2 ₁ 2 ₁		ION\$P2C606\$P2A660
5	<i>C</i> 2	<i>I</i> 112	IMN\$P2C000	25	<i>P</i> mm2		PON\$P2C000\$I2A000
6	<i>P</i> m	<i>P</i> 1m1	PMN\$I2B000	26	<i>P</i> mc2 ₁		PON\$P2C006\$I2A000
6	<i>P</i> m	<i>P</i> 11m	PMN\$I2C000	27	<i>P</i> cc2		PON\$P2C000\$I2A006
7	<i>P</i> c	<i>P</i> 1c1	PMN\$I2B006	28	<i>P</i> ma2		PON\$P2C000\$I2A600
7	<i>P</i> c	<i>P</i> 1n1	PMN\$I2B606	29	<i>P</i> ca2 ₁		PON\$P2C006\$I2A606
7	<i>P</i> c	<i>P</i> 1a1	PMN\$I2B600	30	<i>P</i> nc2		PON\$P2C000\$I2A066
7	<i>P</i> c	<i>P</i> 11a	PMN\$I2C600	31	<i>P</i> mn2 ₁		PON\$P2C606\$I2A000
7	<i>P</i> c	<i>P</i> 11n	PMN\$I2C660	32	<i>P</i> ba2		PON\$P2C000\$I2A660
7	<i>P</i> c	<i>P</i> 11b	PMN\$I2C060	33	<i>P</i> na2 ₁		PON\$P2C006\$I2A666
8	<i>C</i> m	<i>C</i> 1m1	CMN\$I2B000	34	<i>P</i> nn2		PON\$P2C000\$I2A666
8	<i>C</i> m	<i>A</i> 1m1	AMN\$I2B000	35	<i>C</i> mm2		CON\$P2C000\$I2A000
8	<i>C</i> m	<i>I</i> 1m1	IMN\$I2B000	36	<i>C</i> mc2 ₁		CON\$P2C006\$I2A000
8	<i>C</i> m	<i>A</i> 11m	AMN\$I2C000	37	<i>C</i> cc2		CON\$P2C000\$I2A006
8	<i>C</i> m	<i>B</i> 11m	BMN\$I2C000	38	<i>A</i> mm2		AON\$P2C000\$I2A000
8	<i>C</i> m	<i>I</i> 11m	IMN\$I2C000	39	<i>A</i> bm2		AON\$P2C000\$I2A060
9	<i>C</i> c	<i>C</i> 1c1	CMN\$I2B006	40	<i>A</i> ma2		AON\$P2C000\$I2A600
9	<i>C</i> c	<i>A</i> 1n1	AMN\$I2B606	41	<i>A</i> ba2		AON\$P2C000\$I2A660
9	<i>C</i> c	<i>I</i> 1a1	IMN\$I2B600	42	<i>F</i> mm2		FON\$P2C000\$I2A000
9	<i>C</i> c	<i>A</i> 11a	AMN\$I2C600	43	<i>F</i> dd2		FON\$P2C000\$I2A333
9	<i>C</i> c	<i>B</i> 11n	BMN\$I2C660	44	<i>I</i> mm2		ION\$P2C000\$I2A000
9	<i>C</i> c	<i>I</i> 11b	IMN\$I2C060	45	<i>I</i> ba2		ION\$P2C000\$I2A660
10	<i>P</i> 2/ <i>m</i>	<i>P</i> 12/ <i>m</i> 1	PMC\$I1A000\$P2B000	46	<i>I</i> ma2		ION\$P2C000\$I2A600
10	<i>P</i> 2/ <i>m</i>	<i>P</i> 112/ <i>m</i>	PMC\$I1A000\$P2C000	47	<i>P</i> mmm		POC\$I1A000\$P2C000\$P2A000
11	<i>P</i> 2 ₁ / <i>m</i>	<i>P</i> 12 ₁ / <i>m</i> 1	PMC\$I1A000\$P2B060	48	<i>P</i> nnn	Origin 1	POC\$I1A666\$P2C000\$P2A000
11	<i>P</i> 2 ₁ / <i>m</i>	<i>P</i> 112 ₁ / <i>m</i>	PMC\$I1A000\$P2C006	48	<i>P</i> nnn	Origin 2	POC\$I1A000\$P2C660\$P2A066
12	<i>C</i> 2/ <i>m</i>	<i>C</i> 12/ <i>m</i> 1	CMC\$I1A000\$P2B000	49	<i>P</i> ccm		POC\$I1A000\$P2C000\$P2A006
12	<i>C</i> 2/ <i>m</i>	<i>A</i> 12/ <i>m</i> 1	AMC\$I1A000\$P2B000	50	<i>P</i> ban	Origin 1	POC\$I1A660\$P2C000\$P2A000
12	<i>C</i> 2/ <i>m</i>	<i>I</i> 12/ <i>m</i> 1	IMC\$I1A000\$P2B000	50	<i>P</i> ban	Origin 2	POC\$I1A000\$P2C660\$P2A060
12	<i>C</i> 2/ <i>m</i>	<i>A</i> 112/ <i>m</i>	AMC\$I1A000\$P2C000	51	<i>P</i> mma		POC\$I1A000\$P2C600\$P2A600
12	<i>C</i> 2/ <i>m</i>	<i>B</i> 112/ <i>m</i>	BMC\$I1A000\$P2C000	52	<i>P</i> nna		POC\$I1A000\$P2C600\$P2A066
12	<i>C</i> 2/ <i>m</i>	<i>I</i> 112/ <i>m</i>	IMC\$I1A000\$P2C000	53	<i>P</i> mna		POC\$I1A000\$P2C606\$P2A000
13	<i>P</i> 2/ <i>c</i>	<i>P</i> 12/ <i>c</i> 1	PMC\$I1A000\$P2B006	54	<i>P</i> cca		POC\$I1A000\$P2C600\$P2A606
13	<i>P</i> 2/ <i>c</i>	<i>P</i> 12/ <i>n</i> 1	PMC\$I1A000\$P2B606	55	<i>P</i> bam		POC\$I1A000\$P2C000\$P2A660
13	<i>P</i> 2/ <i>c</i>	<i>P</i> 12/ <i>a</i> 1	PMC\$I1A000\$P2B600	56	<i>P</i> ccn		POC\$I1A000\$P2C660\$P2A606
13	<i>P</i> 2/ <i>c</i>	<i>P</i> 112/ <i>a</i>	PMC\$I1A000\$P2C600	57	<i>P</i> bcm		POC\$I1A000\$P2C006\$P2A060
13	<i>P</i> 2/ <i>c</i>	<i>P</i> 112/ <i>n</i>	PMC\$I1A000\$P2C660	58	<i>P</i> nnm		POC\$I1A000\$P2C000\$P2A666
13	<i>P</i> 2/ <i>c</i>	<i>P</i> 112/ <i>b</i>	PMC\$I1A000\$P2C060	59	<i>P</i> mmm	Origin 1	POC\$I1A660\$P2C000\$P2A660
14	<i>P</i> 2 ₁ / <i>c</i>	<i>P</i> 12 ₁ / <i>c</i> 1	PMC\$I1A000\$P2B066	59	<i>P</i> mmm	Origin 2	POC\$I1A000\$P2C660\$P2A600
14	<i>P</i> 2 ₁ / <i>c</i>	<i>P</i> 12 ₁ / <i>n</i> 1	PMC\$I1A000\$P2B666	60	<i>P</i> bcn		POC\$I1A000\$P2C666\$P2A660
14	<i>P</i> 2 ₁ / <i>c</i>	<i>P</i> 12 ₁ / <i>a</i> 1	PMC\$I1A000\$P2B660	61	<i>P</i> bca		POC\$I1A000\$P2C606\$P2A660
14	<i>P</i> 2 ₁ / <i>c</i>	<i>P</i> 112 ₁ / <i>a</i>	PMC\$I1A000\$P2C606	62	<i>P</i> nma		POC\$I1A000\$P2C606\$P2A666
14	<i>P</i> 2 ₁ / <i>c</i>	<i>P</i> 112 ₁ / <i>n</i>	PMC\$I1A000\$P2C666	63	<i>C</i> mcm		COC\$I1A000\$P2C006\$P2A000
14	<i>P</i> 2 ₁ / <i>c</i>	<i>P</i> 112 ₁ / <i>b</i>	PMC\$I1A000\$P2C066	64	<i>C</i> mca		COC\$I1A000\$P2C066\$P2A000
15	<i>C</i> 2/ <i>c</i>	<i>C</i> 12/ <i>c</i> 1	CMC\$I1A000\$P2B006	65	<i>C</i> mnm		COC\$I1A000\$P2C000\$P2A000
15	<i>C</i> 2/ <i>c</i>	<i>A</i> 12/ <i>n</i> 1	AMC\$I1A000\$P2B606	66	<i>C</i> ccm		COC\$I1A000\$P2C000\$P2A006
15	<i>C</i> 2/ <i>c</i>	<i>I</i> 12/ <i>a</i> 1	IMC\$I1A000\$P2B600	67	<i>C</i> mna		COC\$I1A000\$P2C060\$P2A000
15	<i>C</i> 2/ <i>c</i>	<i>A</i> 112/ <i>a</i>	AMC\$I1A000\$P2C600	68	<i>C</i> cca	Origin 1	COC\$I1A066\$P2C660\$P2A660

1.4. SYMMETRY IN RECIPROCAL SPACE

Table A1.4.2.1 (cont.)

No.	Short Hermann–Mauguin symbol	Comments	Explicit symbols	No.	Short Hermann–Mauguin symbol	Comments	Explicit symbols
68	<i>Ccca</i>	Origin 2	COC\$I1A000\$P2C600\$P2A606	122	$\bar{I}4_2d$		ITN\$I4C000\$P2A609
69	<i>Fmmm</i>		FOC\$I1A000\$P2C000\$P2A000	123	<i>P4/mmm</i>		PTC\$I1A000\$P4C000\$P2A000
70	<i>Fddd</i>	Origin 1	FOC\$I1A333\$P2C000\$P2A000	124	<i>P4/mcc</i>		PTC\$I1A000\$P4C000\$P2A006
70	<i>Fddd</i>	Origin 2	FOC\$I1A000\$P2C990\$P2A099	125	<i>P4/nbm</i>	Origin 1	PTC\$I1A660\$P4C000\$P2A000
71	<i>Immm</i>		IOC\$I1A000\$P2C000\$P2A000	125	<i>P4/nbm</i>	Origin 2	PTC\$I1A000\$P4C600\$P2A060
72	<i>Ibam</i>		IOC\$I1A000\$P2C000\$P2A660	126	<i>P4/nnc</i>	Origin 1	PTC\$I1A666\$P4C000\$P2A000
73	<i>Ibca</i>		IOC\$I1A000\$P2C606\$P2A660	126	<i>P4/nnc</i>	Origin 2	PTC\$I1A000\$P4C600\$P2A066
74	<i>Imma</i>		IOC\$I1A000\$P2C060\$P2A000	127	<i>P4/mbm</i>		PTC\$I1A000\$P4C000\$P2A660
75	<i>P4</i>		PTN\$P4C000	128	<i>P4/mnc</i>		PTC\$I1A000\$P4C000\$P2A666
76	<i>P4₁</i>		PTN\$P4C003	129	<i>P4/nmm</i>	Origin 1	PTC\$I1A660\$P4C660\$P2A660
77	<i>P4₂</i>		PTN\$P4C006	129	<i>P4/nmm</i>	Origin 2	PTC\$I1A000\$P4C600\$P2A600
78	<i>P4₃</i>		PTN\$P4C009	130	<i>P4/ncc</i>	Origin 1	PTC\$I1A660\$P4C660\$P2A666
79	<i>I4</i>		ITN\$P4C000	130	<i>P4/ncc</i>	Origin 2	PTC\$I1A000\$P4C600\$P2A606
80	<i>I4₁</i>		ITN\$P4C063	131	<i>P4₂/mnc</i>		PTC\$I1A000\$P4C006\$P2A000
81	$\bar{P}4$		PTN\$I4C000	132	<i>P4₂/mcm</i>		PTC\$I1A000\$P4C006\$P2A006
82	$\bar{I}4$		ITN\$I4C000	133	<i>P4₂/nbc</i>	Origin 1	PTC\$I1A666\$P4C666\$P2A006
83	<i>P4/m</i>		PTC\$I1A000\$P4C000	133	<i>P4₂/nbc</i>	Origin 2	PTC\$I1A000\$P4C606\$P2A060
84	<i>P4₂/m</i>		PTC\$I1A000\$P4C006	134	<i>P4₂/nmm</i>	Origin 1	PTC\$I1A666\$P4C666\$P2A000
85	<i>P4/n</i>	Origin 1	PTC\$I1A660\$P4C660	134	<i>P4₂/nmm</i>	Origin 2	PTC\$I1A000\$P4C606\$P2A066
85	<i>P4/n</i>	Origin 2	PTC\$I1A000\$P4C600	135	<i>P4₂/mbc</i>		PTC\$I1A000\$P4C006\$P2A660
86	<i>P4₂/n</i>	Origin 1	PTC\$I1A666\$P4C666	136	<i>P4₂/mnm</i>		PTC\$I1A000\$P4C666\$P2A666
86	<i>P4₂/n</i>	Origin 2	PTC\$I1A000\$P4C066	137	<i>P4₂/nmc</i>	Origin 1	PTC\$I1A666\$P4C666\$P2A666
87	<i>I4/m</i>		ITC\$I1A000\$P4C000	137	<i>P4₂/nmc</i>	Origin 2	PTC\$I1A000\$P4C606\$P2A600
88	<i>I4₁/a</i>	Origin 1	ITC\$I1A063\$P4C063	138	<i>P4₂/ncm</i>	Origin 1	PTC\$I1A666\$P4C666\$P2A660
88	<i>I4₁/a</i>	Origin 2	ITC\$I1A000\$P4C933	138	<i>P4₂/ncm</i>	Origin 2	PTC\$I1A000\$P4C606\$P2A606
89	<i>P422</i>		PTN\$P4C000\$P2A000	139	<i>I4/mmm</i>		ITC\$I1A000\$P4C000\$P2A000
90	<i>P4₂2</i>		PTN\$P4C660\$P2A660	140	<i>I4/mcm</i>		ITC\$I1A000\$P4C000\$P2A006
91	<i>P4₁22</i>		PTN\$P4C003\$P2A006	141	<i>I4₁/amd</i>	Origin 1	ITC\$I1A063\$P4C063\$P2A063
92	<i>P4₁2,2</i>		PTN\$P4C663\$P2A669	141	<i>I4₁/amd</i>	Origin 2	ITC\$I1A000\$P4C393\$P2A000
93	<i>P4₂22</i>		PTN\$P4C006\$P2A000	142	<i>I4₁/acd</i>	Origin 1	ITC\$I1A063\$P4C063\$P2A069
94	<i>P4₂2,2</i>		PTN\$P4C666\$P2A666	142	<i>I4₁/acd</i>	Origin 2	ITC\$I1A000\$P4C393\$P2A006
95	<i>P4₃22</i>		PTN\$P4C009\$P2A006	143	<i>P3</i>		PRN\$P3C000
96	<i>P4₃2,2</i>		PTN\$P4C669\$P2A663	144	<i>P3₁</i>		PRN\$P3C004
97	<i>I422</i>		ITN\$P4C000\$P2A000	145	<i>P3₂</i>		PRN\$P3C008
98	<i>I4₁22</i>		ITN\$P4C063\$P2A063	146	<i>R3</i>	Hexagonal axes	RRN\$P3C000
99	<i>P4mm</i>		PTN\$P4C000\$I2A000	146	<i>R3</i>	Rhombohedral axes	PRN\$P3Q000
100	<i>P4bm</i>		PTN\$P4C000\$I2A660	147	$\bar{P}3$		PRC\$I3C000
101	<i>P4₂cm</i>		PTN\$P4C006\$I2A006	148	$\bar{R}3$	Hexagonal axes	RRC\$I3C000
102	<i>P4₂nm</i>		PTN\$P4C666\$I2A666	148	$\bar{R}3$	Rhombohedral axes	PRC\$I3Q000
103	<i>P4cc</i>		PTN\$P4C000\$I2A006	149	<i>P312</i>		PRN\$P3C000\$P2G000
104	<i>P4nc</i>		PTN\$P4C000\$I2A666	150	<i>P321</i>		PRN\$P3C000\$P2F000
105	<i>P4₂mc</i>		PTN\$P4C006\$I2A000	151	<i>P3₁12</i>		PRN\$P3C004\$P2G000
106	<i>P4₂bc</i>		PTN\$P4C006\$I2A660	152	<i>P3₁21</i>		PRN\$P3C004\$P2F008
107	<i>I4mm</i>		ITN\$P4C000\$I2A000	153	<i>P3₂12</i>		PRN\$P3C008\$P2G000
108	<i>I4cm</i>		ITN\$P4C000\$I2A006	154	<i>P3₂21</i>		PRN\$P3C008\$P2F004
109	<i>I4₁md</i>		ITN\$P4C063\$I2A666	155	<i>R32</i>	Hexagonal axes	RRN\$P3C000\$P2F000
110	<i>I4₁cd</i>		ITN\$P4C063\$I2A660	155	<i>R32</i>	Rhombohedral axes	PRN\$P3Q000\$P2E000
111	$\bar{P}4_2m$		PTN\$I4C000\$P2A000	156	<i>P3m1</i>		PRN\$P3C000\$I2F000
112	$\bar{P}4_2c$		PTN\$I4C000\$P2A006	157	<i>P31m</i>		PRN\$P3C000\$I2G000
113	$\bar{P}4_2,1m$		PTN\$I4C000\$P2A660	158	<i>P3c1</i>		PRN\$P3C000\$I2F006
114	$\bar{P}4_2,1c$		PTN\$I4C000\$P2A666	159	<i>P31c</i>		PRN\$P3C000\$I2G006
115	$\bar{P}4m2$		PTN\$I4C000\$P2D000	160	<i>R3m</i>	Hexagonal axes	RRN\$P3C000\$I2F000
116	$\bar{P}4c2$		PTN\$I4C000\$P2D006	160	<i>R3m</i>	Rhombohedral axes	PRN\$P3Q000\$I2E000
117	$\bar{P}4b2$		PTN\$I4C000\$P2D660	161	<i>R3c</i>	Hexagonal axes	RRN\$P3C000\$I2F006
118	$\bar{P}4n2$		PTN\$I4C000\$P2D666	161	<i>R3c</i>	Rhombohedral axes	PRN\$P3Q000\$I2E666
119	$\bar{I}4m2$		ITN\$I4C000\$P2D000	162	$\bar{P}31m$		PRC\$I3C000\$P2G000
120	$\bar{I}4c2$		ITN\$I4C000\$P2D006	163	$\bar{P}31c$		PRC\$I3C000\$P2G006
121	$\bar{I}4_2m$		ITN\$I4C000\$P2A000	164	$\bar{P}3m1$		PRC\$I3C000\$P2F000

1. GENERAL RELATIONSHIPS AND TECHNIQUES

Table A1.4.2.1 (cont.)

No.	Short Hermann–Mauguin symbol	Comments	Explicit symbols
165	$P\bar{3}c1$		PRC\$I3C000\$P2F006
166	$R\bar{3}m$	Hexagonal axes	RRC\$I3C000\$P2F000
166	$R\bar{3}m$	Rhombohedral axes	PRC\$I3Q000\$P2E000
167	$R\bar{3}c$	Hexagonal axes	RRC\$I3C000\$P2F006
167	$R\bar{3}c$	Rhombohedral axes	PRC\$I3Q000\$P2E666
168	$P6$		PHN\$P6C000
169	$P6_1$		PHN\$P6C002
170	$P6_5$		PHN\$P6C005
171	$P6_2$		PHN\$P6C004
172	$P6_4$		PHN\$P6C008
173	$P6_3$		PHN\$P6C006
174	$P\bar{6}$		PHN\$I6C000
175	$P6/m$		PHC\$I1A000\$P6C000
176	$P6_3/m$		PHC\$I1A000\$P6C006
177	$P622$		PHN\$P6C000\$P2F000
178	$P6_122$		PHN\$P6C002\$P2F000
179	$P6_522$		PHN\$P6C005\$P2F000
180	$P6_222$		PHN\$P6C004\$P2F000
181	$P6_422$		PHN\$P6C008\$P2F000
182	$P6_322$		PHN\$P6C006\$P2F000
183	$P6mm$		PHN\$P6C000\$I2F000
184	$P6cc$		PHN\$P6C000\$I2F006
185	$P6_3cm$		PHN\$P6C006\$I2F006
186	$P6_3mc$		PHN\$P6C006\$I2F000
187	$P\bar{6}m2$		PHN\$I6C000\$P2G000
188	$P\bar{6}c2$		PHN\$I6C006\$P2G000
189	$P\bar{6}2m$		PHN\$I6C000\$P2F000
190	$P\bar{6}2c$		PHN\$I6C006\$P2F000
191	$P6/mmm$		PHC\$I1A000\$P6C000\$P2F000
192	$P6/mcc$		PHC\$I1A000\$P6C000\$P2F006
193	$P6_3/mcm$		PHC\$I1A000\$P6C006\$P2F006
194	$P6_3/mmc$		PHC\$I1A000\$P6C006\$P2F000
195	$P23$		PCN\$P3Q000\$P2C000\$P2A000
196	$F23$		FCN\$P3Q000\$P2C000\$P2A000
197	$I23$		ICN\$P3Q000\$P2C000\$P2A000
198	$P2_13$		PCN\$P3Q000\$P2C606\$P2A660
199	$I2_13$		ICN\$P3Q000\$P2C606\$P2A660

No.	Short Hermann–Mauguin symbol	Comments	Explicit symbols
200	$Pm\bar{3}$		PCC\$I3Q000\$P2C000\$P2A000
201	$Pn\bar{3}$	Origin 1	PCC\$I3Q666\$P2C000\$P2A000
201	$Pn\bar{3}$	Origin 2	PCC\$I3Q000\$P2C660\$P2A066
202	$Fm\bar{3}$		FCC\$I3Q000\$P2C000\$P2A000
203	$Fd\bar{3}$	Origin 1	FCC\$I3Q333\$P2C000\$P2A000
203	$Fd\bar{3}$	Origin 2	FCC\$I3Q000\$P2C330\$P2A033
204	$Im\bar{3}$		ICC\$I3Q000\$P2C000\$P2A000
205	$Pa\bar{3}$		PCC\$I3Q000\$P2C606\$P2A660
206	$Ia\bar{3}$		ICC\$I3Q000\$P2C606\$P2A660
207	$P432$		PCN\$P3Q000\$P4C000\$P2D000
208	$P4_232$		PCN\$P3Q000\$P4C666\$P2D666
209	$F432$		FCN\$P3Q000\$P4C000\$P2D000
210	$F4_132$		FCN\$P3Q000\$P4C993\$P2D939
211	$I432$		ICN\$P3Q000\$P4C000\$P2D000
212	$P4_332$		PCN\$P3Q000\$P4C939\$P2D399
213	$P4_132$		PCN\$P3Q000\$P4C393\$P2D933
214	$I4_132$		ICN\$P3Q000\$P4C393\$P2D933
215	$P\bar{4}3m$		PCN\$P3Q000\$I4C000\$I2D000
216	$F\bar{4}3m$		FCN\$P3Q000\$I4C000\$I2D000
217	$I\bar{4}3m$		ICN\$P3Q000\$I4C000\$I2D000
218	$P\bar{4}3n$		PCN\$P3Q000\$I4C666\$I2D666
219	$F\bar{4}3c$		FCN\$P3Q000\$I4C666\$I2D666
220	$I\bar{4}3d$		ICN\$P3Q000\$I4C939\$I2D399
221	$Pm\bar{3}m$		PCC\$I3Q000\$P4C000\$P2D000
222	$Pn\bar{3}n$	Origin 1	PCC\$I3Q666\$P4C000\$P2D000
222	$Pn\bar{3}n$	Origin 2	PCC\$I3Q000\$P4C600\$P2D006
223	$Pm\bar{3}n$		PCC\$I3Q000\$P4C666\$P2D666
224	$Pn\bar{3}m$	Origin 1	PCC\$I3Q666\$P4C666\$P2D666
224	$Pn\bar{3}m$	Origin 2	PCC\$I3Q000\$P4C066\$P2D660
225	$Fm\bar{3}m$		FCC\$I3Q000\$P4C000\$P2D000
226	$Fm\bar{3}c$		FCC\$I3Q000\$P4C666\$P2D666
227	$Fd\bar{3}m$	Origin 1	FCC\$I3Q333\$P4C993\$P2D939
227	$Fd\bar{3}m$	Origin 2	FCC\$I3Q000\$P4C693\$P2D936
228	$Fd\bar{3}c$	Origin 1	FCC\$I3Q999\$P4C993\$P2D939
228	$Fd\bar{3}c$	Origin 2	FCC\$I3Q000\$P4C093\$P2D930
229	$Im\bar{3}m$		ICC\$I3Q000\$P4C000\$P2D000
230	$Ia\bar{3}d$		ICC\$I3Q000\$P4C393\$P2D933

$$\begin{aligned}
 1A &= \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} & 2A &= \begin{pmatrix} 1 & 0 & 0 \\ 0 & \bar{1} & 0 \\ 0 & 0 & \bar{1} \end{pmatrix} & 2B &= \begin{pmatrix} \bar{1} & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & \bar{1} \end{pmatrix} \\
 2C &= \begin{pmatrix} \bar{1} & 0 & 0 \\ 0 & \bar{1} & 0 \\ 0 & 0 & 1 \end{pmatrix} & 2D &= \begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & \bar{1} \end{pmatrix} & 2E &= \begin{pmatrix} 0 & \bar{1} & 0 \\ \bar{1} & 0 & 0 \\ 0 & 0 & \bar{1} \end{pmatrix} \\
 2F &= \begin{pmatrix} 1 & \bar{1} & 0 \\ 0 & \bar{1} & 0 \\ 0 & 0 & \bar{1} \end{pmatrix} & 2G &= \begin{pmatrix} 1 & 0 & 0 \\ 1 & \bar{1} & 0 \\ 0 & 0 & \bar{1} \end{pmatrix} & 3Q &= \begin{pmatrix} 0 & 0 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix} \\
 3C &= \begin{pmatrix} 0 & \bar{1} & 0 \\ 1 & \bar{1} & 0 \\ 0 & 0 & 1 \end{pmatrix} & 4C &= \begin{pmatrix} 0 & \bar{1} & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix} & 6C &= \begin{pmatrix} 1 & \bar{1} & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{pmatrix},
 \end{aligned}$$

where only matrices of proper rotation are given (and required), since the corresponding matrices of improper rotation are created by the program for appropriate value of the r_i indicator.

The first character of a symbol is the order of the axis of rotation and the second character specifies its orientation: in terms of direct-space lattice vectors, we have

$$\begin{aligned}
 A &= [100], B = [010], C = [001], D = [110], \\
 E &= [1\bar{1}0], F = [100], G = [210] \text{ and } Q = [111]
 \end{aligned}$$

for the standard orientations of the axes of rotation. Note that the axes 2F, 2G, 3C and 6C appear in trigonal and hexagonal space groups.

In the above scheme a space group is determined by one, two or at most three generators [see (A1.4.2.1)]. It should be pointed out that a convenient way of achieving a representation of the space group in any setting and relative to any origin is to start from the standard generators in Table A1.4.2.1 and let the computer program perform the appropriate transformation of the generators only, as in equations (1.4.4.4) and (1.4.4.5). The subsequent expansion of the transformed generators and the formation of the required products [see (A1.4.2.1)]