1.2. Printed symbols for conventional centring types

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1.2.1. Printed symbols for the conventional centring types of one-, two- and three-dimensional cells

For 'reflection conditions', see Tables 2.2.13.1 and 2.2.13.3. For the new centring symbol S, see Note (iii) below.

Printed symbol	Centring type of cell	Number of lattice points per cell	Coordinates of lattice points within cell
One dimension			
p	Primitive	1	0
Two dimensions			
p	Primitive	1	0, 0
c	Centred	2	0, 0; $\frac{1}{2}, \frac{1}{2}$
$h*$	Hexagonally centred	3	0, 0; $\frac{2}{3}, \frac{1}{3}; \frac{1}{3}, \frac{2}{3}$
Three dimensions			
P	Primitive	1	0, 0, 0
C	C-face centred	2	0, 0, 0; $\frac{1}{2}, \frac{1}{2}, 0$
A	A-face centred	2	0, 0, 0; $0, \frac{1}{2}, \frac{1}{2}$
B	B-face centred	2	0, 0, 0; $\frac{1}{2}, 0, \frac{1}{2}$
I	Body centred	2	0, 0, 0; $\frac{1}{2}, \frac{1}{2}, \frac{1}{2}$
F	All-face centred	4	0, 0, 0; $\frac{1}{2}, \frac{1}{2}, 0; 0, \frac{1}{2}, \frac{1}{2}; \frac{1}{2}, 0, \frac{1}{2}$
$R\dagger$	Rhombohedrally centred (description with 'hexagonal axes')	3	$\left\{\begin{array}{l} 0, 0, 0;\ \frac{2}{3}, \frac{1}{3}, \frac{1}{3};\ \frac{1}{3}, \frac{2}{3}, \frac{2}{3}\ \text{('obverse setting')} \\ 0, 0, 0;\ \frac{1}{3}, \frac{2}{3}, \frac{1}{3};\ \frac{2}{3}, \frac{1}{3}, \frac{2}{3}\ \text{('reverse setting')} \end{array}\right.$
	Primitive (description with 'rhombohedral axes')	1	0, 0, 0
$H\ddagger$	Hexagonally centred	3	0, 0, 0; $\frac{2}{3}, \frac{1}{3}, 0; \frac{1}{3}, \frac{2}{3}, 0$

* The two-dimensional triple hexagonal cell h is an alternative description of the hexagonal plane net, as illustrated in Fig. 5.1.3.8. It is not used for systematic plane-group description in this volume; it is introduced, however, in the sub- and supergroup entries of the plane-group tables (Part 6). Plane-group symbols for the h cell are listed in Chapter 4.2. Transformation matrices are contained in Table 5.1.3.1.

† In the space-group tables (Part 7), as well as in *IT* (1935) and *IT* (1952) [for reference notation, see footnote on first page of Chapter 2.1], the seven rhombohedral R space groups are presented with two descriptions, one based on *hexagonal axes* (triple cell), one on *rhombohedral axes* (primitive cell). In the present volume, as well as in *IT* (1952), the *obverse* setting of the triple hexagonal cell R is used. Note that in *IT* (1935) the *reverse* setting was employed. The two settings are related by a rotation of the hexagonal cell with respect to the rhombohedral lattice around a threefold axis, involving a rotation angle of $60°$, $180°$ or $300°$ (*cf.* Fig. 5.1.3.6). Further details may be found in Chapter 2.1, Section 4.3.5 and Chapter 9.1. Transformation matrices are contained in Table 5.1.3.1.

‡ The triple hexagonal cell H is an alternative description of the hexagonal Bravais lattice, as illustrated in Fig. 5.1.3.8. It was used for systematic space-group description in *IT* (1935), but replaced by P in *IT* (1952). In the space-group tables of this volume (Part 7), it is only used in the sub- and supergroup entries (*cf.* Section 2.2.15). Space-group symbols for the H cell are listed in Section 4.3.5. Transformation matrices are contained in Table 5.1.3.1.

1.2.2. Notes on centred cells

(i) The centring type of a cell may change with a change of the basis vectors; in particular, a primitive cell may become a centred cell and *vice versa.* Examples of relevant transformation matrices are contained in Table 5.1.3.1.

(ii) Section 1.2.1 contains only those conventional centring symbols which occur in the Hermann–Mauguin space-group symbols. There exist, of course, further kinds of centred cells which are unconventional; an interesting example is provided by the triple rhombohedral D cell, described in Section 4.3.5.3.

(iii) For the use of the letter S as a new general, setting-independent 'centring symbol' for monoclinic and orthorhombic Bravais lattices see Chapter 2.1, especially Table 2.1.2.1, and de Wolff *et al.* (1985).

(iv) Symbols for crystal families and Bravais lattices in one, two and three dimensions are listed in Table 2.1.2.1 and are explained in the *Nomenclature Report* by de Wolff *et al.* (1985).

references