Two System are used in the notation of Molecular point group (i.e Schoenflies Symbols) and notation of Point groups for Crystal (i.e Hermann - Mauguin Symbol).

(1) Schoenflies Notions :-

It involves Molecular point groups i.e C_{nv}, C_{nh}, D_{nh}, T_d and O_h

where n is the maximum number of rotation axes.
v is the vertical mirror plane, It is stated only in the absence of horizontal mirror planes.
h is the horizontal mirror plane
T is the tetrahedral point group
O is the Octahedral Point group

Examples.

(i) C_n denotes the presence of n-fold rotation axis in molecular poit group

(ii) S_{2n} denotes the presence of only a 2n-fold rotation-reflection axis in point group.

(iii) C_{nh} denotes that both the C_n and mirror plane (or reflection plane) are perpendicular to the axis of rotation.

(iv) On the Contrary C_{nv} indicates both the C_n and mirror plane are parallel to the axis of rotation.

(2) Hermann - Mauguin Notation :-

It is used for space groups as well as Crystallographic Point gr. It provides the maximum axis of rotation.

For example, In this notation the Number '2' is used to designate a single 2-fold rotation axis in a point group

Note :- for example If schoenflies notation depicted as C_{2h} for a point gr; then it is represented in Hermann - Mauguin system as 2/m and it is readed as two slash m or 2/m

Where m denotes the mirror plane and the slash (/) denotes that the mirror plane is perpendicular to the two-fold axis.

Lattice System	—	Point Groups	—	—	—	—	—
Triclinic	1	-1					
Monoclinic	2	m	2/m				
Tetragonal	+4	-4	4/m	422	4mm	-42m	4/mmm
Hexagonal	6	-6	6/m	622	6mm	-62m	6/mmm

In a Crystal about 230 space groups are present in 3D [illegible]. these space groups are Combination of 14 Bravias lattices and 32 Crystallographic point groups.

Group Postulates: -

The Complete set of operations forms a mathematical group. In order that the Symmetry elements A, B, C, ··· forms a mathematical group 'G', the following Conditions must be satisfied.

1. Two elements A and B of a group Combine to give a third element C, which is also an element of the group.

$$AB = C$$

It means that the application of B followed by A is equivalent to the application of C

If $AB = BA$, the elements A and B are said to Commute.

2. An element Combines with itself to form another element of the group.

3. The group must Contain the identity element E which Commutes with all the element and leaves them unchanged.

$$EA = AE = A$$

$$EB = BE = B \quad \text{etc.}$$

4. Every element of the group obeys the associative law - of Combination

$$A(BC) = (AB)C$$

5. Every element A of a group has an inverse A^{-1} which is also an element of the group

$$AA^{-1} = A^{-1}A = E$$