

## 1.88: Priority rule

When more than one kind of symmetry element occurs for a given symmetry direction, the choice for defining the appropriate Hermann–Mauguin symbol for the space group is made in order of descending priority:

- $m, e, a, b, c, n, d$ ;
- rotation axes before screw axes.

There are a few exceptions to this choice:

1. For glide planes in centered monoclinic space groups, the priority rule is purposely not followed in order to bring out the relations between the three ‘cell choices’ given for each setting.
2. For orthorhombic space groups, the priority rule is applied only to the ‘standard symbol’. The symbols for the other five settings are obtained from the standard symbol by the appropriate transformations, without invoking the priority rule again.
3. Space-group types  $I222$  and  $I2_12_12_1$  are two distinct types. Both contain parallel twofold rotation and screw axes and thus would receive the same symbol according to the priority rule. In  $I222$ , the three rotation axes and the three screw axes intersect, whereas in  $I2_12_12_1$  neither the three rotation axes nor the three screw axes intersect.
4. For space groups of type No. 73, the standard symbol  $Ibca$  was adopted, instead of  $Ibaa$  according to the rule, because  $Ibca$  displays the equivalence of the three symmetry directions clearly.
5. In tetragonal space groups with both  $a$  and  $b$  glide planes containing the  $[001]$  direction, the preference was given to  $b$ , as in  $P4bm$ .
6. In cubic space groups where tertiary symmetry planes with glide components  $1/2, 0, 0; 0, 1/2, 0; 0, 0, 1/2$  and  $1/2, 1/2, 1/2$  coexist, the tertiary symmetry element was called  $n$  in  $P$  groups (instead of  $a, b$  or  $c$ ) but  $c$  in  $F$  groups, because these symmetry elements intersect the origin.
7. Space groups of type  $I23$  and  $I2_13$  (199) are two distinct types of space groups. For this pair, the same arguments apply as given above for  $I222$  and  $I2_12_12_1$ .

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