

On the other hand, 5-dimensional crystallographic groups of the category $G_{53\dots t}$ can be found by the use of the 3-dimensional classic groups $G_{3\dots t}$ and their generalizations with antisymmetry, p- and (p')-symmetry (ignoring enantiomorphism), when $p=2,3,4,6$ (where only the groups of the full marked generalized symmetries are extracted). Thus, there are 33075 G_{53} (in accordance with the full numbers of the groups G_3, G_3^1, G_3^2 and $G_3^{p'}$); 1208 G_{530} (in accordance with the full numbers of the groups $G_{30}, G_{30}^1, G_{30}^2$ and $G_{30}^{p'}$); 5177 G_{531} ; 9282 G_{532} ; 1274 G_{5320} ; 2597 G_{5321} .

Finally, the groups of the categories G_{52} and G_{521} are fully described by the classical groups G_2 and G_{21} and their generalizations with the 31 nontrivial crystallographic P-symmetries in the geometric classification.

For the completion of the scheme of the 5-dimensional crystallographic groups of symmetry it is necessary to find the numbers of the groups of the categories $G_5; G_{50}; G_{51}; G_{54}$ and G_{510} .

References.

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20.1-4 DIFFRACTION GROUPS OF CBED PATTERNS. By P.Goodman, Division of Chemical Physics, CSIRO, Australia.

Symmetry rules so far derived for CBED patterns can be summarised in the form of matrix generators operating in diffraction space, which contain the 2-dimensional rotation groups as a partitioned component.

In contrast to the matrix representation of space groups in kinematic x-ray diffraction space (i.e. Fourier space: Beinstock, A. and Ewald, P.P. (1962), Acta Cryst. 15, 1253) it is the di-periodic layer groups rather than the 3-dimensional space groups which are defined. This is a consequence of the substitution of parallel-plate boundary conditions for the restrictions imposed by Friedel's law in x-ray kinematic scattering.

As a result 80 groups, containing 43 symmorphic groups, can be defined in diffraction space. From these the previously-derived 31 CBED groups (Buxton, B.F. Eades, J.A., Steeds, J.W. and Rackham, G.M. (1976), Phil.Trans. 281, 171) emerge as the point-group component. It is therefore clear that the same boundary conditions have been assumed in this previous derivation as in the present one. The two systems are hence mutually consistent, the increased resolution of the new derivation coming from (a) the use of arithmetic rather than geometric definition for the rotation group and (b) the inclusion of dynamic extinctions of the zero layer.

20.1-5 THE METHOD OF MATRICAL REPRESENTATION OF CRYSTAL SYMMETRY GROUPS AND ITS POSSIBILITIES By T.N.Liopo, V.A.Liopo. Brest pedagogical institute, Brest, Belorussia, USSR.

The correlations between macrosymmetry, the parameters of the unit cells and physical properties of crystals are analysed. An analytical method of construction and analysis of crystallographic projections is shown. It is developed the practical matrical method for mutual transition of crystal and reciprocal lattice. It is given the way of transference from one crystallographic basis to another and analysed the changes of crystallographic indexes of planes, directions and points in this case. It is proposed the method of matrical representation for symmetry groups of sets and layers, and the limited, gomothetical and black-white groups of crystals. The results of calculations are compared to the experimental data got for some monoclinical (layer silicates) and cubical (semiconductors) crystals.

20.1-6 ON THE DIFFRACTION ENHANCEMENT OF SYMMETRY. By Hitoshi Iwasaki, The Institute of Physical and Chemical Research, Wako-shi, Saitama 351, Japan.

The point group symmetry of the weighted reciprocal lattice, or diffraction symmetry, can in some special cases be higher than the Laue-class symmetry of the crystal. When such a phenomenon occurs other than as a result of Friedel law, it is called diffraction enhancement of symmetry: for example, a triclinic crystal may produce monoclinic or orthorhombic diffraction patterns, and in fact several such cases have actually been recognized. Efforts to shed light on this problem have been made by many authors (Iwasaki, Acta Cryst. (1972) A28, 253; Perez-Mato et al., *ibid.* (1977) A33, 466; Sadanaga et al., *ibid.* (1979) A35, 115 and others), but the question to what extent the enhancement may occur has been left unsettled.

On examining structures (S) which show diffraction enhancement, some of them were found to be expressed by superposition of an average structure (A) and a few modulating structures (M). If both A and M are of higher symmetry than S, and in addition if each of A and M gives finite diffraction intensities at separate set of reciprocal lattice points (for example, only $h=2n$ for A and only $h=2n+1$ for M), then the symmetry of overall diffraction pattern produced by S should conform to the symmetry of A and M, and not to that of S. By applying this principle to various combinations of the point groups of S, A and M, it is possible to conclude that every types of enhancement do occur at least mathematically. It means that when a diffraction group D corresponding to an unknown structure is arbitrarily given, the point group of S may be any subgroup of D.