Two dual spaces are extensively used in crystallography: the point space \( E \), hosting the crystal pattern; and the vector space \( V \), where face normals and reciprocal-lattice vectors are defined. The term “point group” is used in crystallography to indicate four different types of groups in these two spaces. 1) Morphological point groups in \( V \): They can be obtained from maximal holohedries (holohedries not properly contained in another holohedry) by iteratively descending to proper subgroups: this gives 21 point groups in \( V \) and 136 point groups in \( V^2 \), which are then classified into 10 and 32 point-group types, respectively (on the basis of which geometrical crystal classes are defined), and into 9 and 18 abstract isomorphism classes. 2) Symmetry groups of atomic groups and coordination polyhedra in \( E \): They coincide with molecular point groups and fall into infinitely many different isomorphism classes, since due to the absence of periodicity these groups are not subject to the crystallographic restriction. 3) Site-symmetry groups in \( E \): They are the finite subgroups of space groups. For each site-symmetry group, conjugation by the translation subgroup yields infinitely many different groups, but transforming the fixed point to the origin of \( E \) allows to classify them into geometric crystal classes exactly like point groups in \( P \). A finer classification of site-symmetry groups into \textit{species} is however introduced that takes into account their orientation in space: species of site-symmetry groups in \( E \) uniquely correspond to point groups in \( P \). 4) Groups of matrices representing the linear parts of space group operations in \( E \): They are isomorphic both to the point groups in \( V \) and to the factor groups \( G/T \), where \( T \) is the translation subgroup of a space group \( G \).

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