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The principles, describing formation of crystalline structures, are based on a various approaches which are taking into account such factors as intermolecular hydrogen bondings, weak interactions, steric factors, peculiarities of molecular structure. Recently it was found that the role of some factors was overestimated. However correlation and interdependence of these factors remain by the object of a research till now. As a result of our comparative analysis of molecular and supramolecular structure of extensive series of a new organic and elementoorganic compounds of different nature, we offer an additional principle of formation of crystalline packing based on manifestation amphiphilic properties of molecules. The hydrophobic and hydrophilic regions are found to be strongly localised in the crystals of compounds. This localization leads to various types of supramolecular structures, these types being connected with the symmetry of crystals formed. Calculations of the hydrophility degree of molecular fragments and their correlation with the type of packing of molecules in crystal show, that the thermodynamic incompatibility of pseudo-phases, exhibited in localization of hydrophilic and hydrophobic areas, results in the origination of supercrystalline structures at a subatomic level in crystals. In the considered compounds the superstructures spanning all possible types of superstructures - completely hydrophilic structure, packing of hydrophilic cylinders and spherical areas in hydrophobic matrix, lamellar type with alternation hydrophilic and hydrophobic layers and inverse structures down to completely hydrophobic structure, - are observed. The type of superstructure depends on the hydrophilic-hydrophobic volume ratio, calculated for molecular fragments. The analogy between superstructures, formed due to manifestation of amphiphilic properties of molecules in crystals, and superlattices in the block-copolymer systems is drawn. It was established, that the similar separation of areas is observed in crystals of different organic compounds irrespective of their nature. Thus, the theory, developed for the description of microphase separation in polymeric heterogeneous systems, can be used for analysis not only packing of molecules of organic compounds in crystal, but also for a prediction of type of molecular packing. The analysis of the distribution of formed structures in the compounds under investigation and similar compounds, being available in Cambridge crystallographic database, is carried out and the correlation between a type of formed structures and symmetry of crystals is analysed. The possibility of analysis of polymorphic, enantiopure and racemic structures in the framework of the offered model is shown.

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