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Chloride Intracellular Channel (CLIC) proteins are recently discovered members of the chloride ion channels family that have the unusual property of existing as both soluble proteins and integral membrane channels. There are 6 members in the human CLIC family (CLIC1-6). Most of CLICs exist in cells as both soluble and integral membrane proteins. Although the specific cellular function of these CLIC proteins remains unclear, CLICs have been associated with some cellular functions such as cell cycle regulation and maintenance of intracellular membranes. The mechanism of CLIC insertion into the membrane remains unclear, however previous studies suggest that this process may involve structural changes and/or protein-protein interactions. CLIC proteins are believed to form a complex with the N-terminus FERM domain (band Four-point-one, Ezrin, Radixin, Moesin domain) of the ERM (Ezrin-Radixin-Moesin) proteins. ERM is a member of protein 4.1 superfamily which is characterised by the ~300kDa FERM domain. This superfamily mediates the cross-linking between the cytoskeleton and the plasma membrane. Current studies using both blue native polyacrylamide gel electrophoresis and Western Blots indicate that CLIC1 forms a complex with the FERM domain of Ezrin. Further crystallographic studies of these complexes are necessary to reveal the nature of the complex.

Keywords: CLIC, FERM domain, macromolecular complexes

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Interaction of sols on a dispersion containing only the counterions dissociated from the surface

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The electrical potential for the case of two identical, planar parallel sols immersed in a salt-free medium, where the ionic species is the counterions come solely from that dissociated from the surfaces, is evaluated. We show that in a salt-free dispersion if the separation distance between two sols is sufficiently far, the electrical repulsive force dominates, that is, the total energy is positive and does not have a secondary minimum, which is not the case for a dispersion where both coions and counterions are present. Also, the conditions used to calculate the critical coagulation concentration in the classic DLVO (Derjaguin, Landau, Verwey, and Overbeek) theory become inappropriate and Derjaguin approximation is inapplicable. We show that if the surface charge density exceeds ca. 0.04 C/m^2 , the stability of a salt-free dispersion remains essentially the same. If the surface charge density is sufficiently high, the maximum separation distance between two particles below which coagulation occurs is in the range [0,1 nm] and [1,7 nm] for the case where Hamaker constant are 10^{-20} J and 10^{-19} J , respectively.

Keywords: salt-free dispersion, Poisson-Boltzmann equation, stability

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The origin of polar ordering in high pressure phases of chloroform and bromoform

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The majority of materials crystallize in centrosymmetric or nonpolar space groups. One of the examples are chloroform (CHCl_3 , CF) and bromoform (CHBr_3 , BF). Despite their pyramidal molecular structure all their low-temperature (LT) crystalline phases are centrosymmetric. This contrasts with most of crystals built of pyramidal molecules or ions, like a prototypical pyroelectric $\alpha\text{-LiIO}_3$. Therefore we undertook to perform an X-ray diffraction study of pressure-frozen CF and BF. Only one LT phase of CF was reported (space group $Pnma$) [1], while BF is known to exist in 3 phases: a disordered one ($P6_3/m$), formed just below melting point, which transforms on cooling further to ordered $P-1$ or $P-3$ polymorphs [2]. Due to the less attractive character of Cl...Cl interactions the structure of CF is distinct from the BF phases, in which the molecules are arranged in bipolar sheets interacting by a cooperative triangular motif of Br...Br bridges. We revealed that CF crystallizes at 0.62 GPa yielding a LT phase, which transforms between 0.62 and 0.75 GPa to a polar $P6_3$ phase. Isochorically frozen BF forms isostructural polar crystals already at the freezing pressure of ca. 0.1 GPa. It can be shown that X...X and H...X interactions in the structures of CF and BF can be rationalized in terms of electrostatic forces and molecular electrostatic potential mapped onto molecular surfaces. The polar crystals of CF and BF contribute to a better understanding of the structural mechanism responsible for polar symmetries of materials, required for technological applications [3].

[1] Fourme, R.; Renaud, M.; C. R. Acad. Sc. Paris 1966, 263, 69-72.

[2] Myers, R.; Torrie, B. H.; Powell, B. M. J. Chem. Phys. 1983, 79, 1495-1504.

[3] Curtin, D. Y.; Paul, I. C.; Chem. Rev. 1981, 81, 525-541.

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Construction of 2_1 helical assemblies of fluorescent molecules and the study on their properties

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2_1 helical assemblies are often found and general in crystals. Conventionally, it has been assumed that right- or left- handedness of 2_1 helical assemblies cannot be determined on the basis of mathematical viewpoint, because the two-fold screw axis operation includes just 180 degrees rotation and translation. We had, however, been aware of that those can be chiral when the objects consisting of themselves are not spherically-symmetric. Recently, we have suggested that it is possible to define the handedness of 2_1 helical aggregates observed in crystals on the basis of the molecular tilt against the 2_1 axis. In this study, we prepared the crystals in which fluorescent molecules form 2_1 helical assemblies. Namely, crystallization of 9-fluorenone-2-carboxylic acid (9F2CA) and chiral amines yielded homo-chiral 2_1 helical structures (Figure). We determined the handedness of the 2_1 helical assemblies on the basis