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ISSN: 2329-6798
Modern Chemistry & Applications

Opinion Article

Mesogenic Groups of Liquid Crystals and Phase Transitions

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DESCRIPTION

The liquid crystals are sensitive to temperature and involve in physical properties of nematic, cholesteric, and smectic liquid crystals. The molecular theories of liquid crystal phases and molecular field theories of phase transitions are between various liquid crystal phases that are presented. The elastic theory and hydrodynamics of liquid crystals are developed. A wide variety of phenomena in liquid crystals, which include elastic distortions, disclinations, flow properties, fluctuations, light scattering, wave propagation, nuclear magnetic resonance, effects of magnetic and electric fields, electro hydrodynamics, and optical properties.

The liquid crystals, which are obtained by melting a crystalline solid, are called "Thermotropic". The liquid crystalline behavior is also found in certain colloidal solutions, such as aqueous solutions of certain polymers. This class of liquid crystals is called "Lyotropic". For lyotropic liquid crystals the important controllable parameter include concentration, rather than temperature or pressure. Most of the theories that are presented below are equally valid for thermotropic and lyotropic liquid crystals.

The high mobility of photoconduction in columnar mesophases of disc-shaped (discotic) liquid crystals is the charge carriers of holes or electrons. The pitch of wavelength of light is reflected by the Bragg, which is temperature dependent. The number of mesogenic groups can be increased in the periphery by hydrosilylation of first generation hexadecavinyl octasilsesquioxane dendimer-2 with cyanobiphenyl mesogens containing terminal Si-H groups, thereby affording the liquid crystal multipede-3, which contains sixteen cyanobiphenyl groups attached to dendritic core.

For this material the 1H NMR spectrum shows well resolved resonances for all the protons of cyanobiphenyl mesogenic groups, which indicate the complete conformational freedom of mesogenic units in solution. The polyphilic nature of amphoteric materials has more complex morphologies and amphiphiles with different levels of hierarchical ordering crystals.

The graphene oxide plates are arranged around the liquid crystal disclinations. The complementary Si NMR spectroscopy shows that the reaction of cyanobiphenyl mesogens with 3 vinyl units was incomplete, and although the distribution was much sharper than normally which is found for polymers, the material shows a degree of dispersity and not a unique compound. The color of liquid crystals can change dramatically over a temperature range of a few degrees and the lyotropic liquid crystals are induced by the classic solvent molecules.

The lyotropic liquid crystal systems, such as reversed discontinuous cubic and hexagonal mesophases, are attracting more and more attention because of their unique microstructures and physicochemical properties. The various bioactive molecules such as chemical drugs, peptides and proteins can be solubilized in either aqueous or oil phase and can be protected from hydrolysis or oxidation. Several studies have demonstrated for releasing of bioactive molecules from reversed cubic and hexagonal mesophases.

The graphene oxide flakes are present in aqueous dispersion in liquid crystalline form. The motion of diffusion means the distance between nuclei of different molecule changes, which results in zero intermolecular contribution to dipolar coupling. The orientation of liquid crystals can be influenced by applying a magnetic field or by mechanical deformation.

CONCLUSION

The recent advances of reversed cubic and hexagonal mesophases, especially with respect to their preparation methods and applications in the field of drug delivery. In addition, to potential problems and possible future research directions the chiral smectic of C and H liquid crystals are ferroelectric. In liquid crystal samples, the molecules rotate and diffuse rapidly, but they are not random. The dislocations and disclinations breaking of translational and rotational symmetries are the basic defects with continuous in liquid crystals.

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Received: 15-Aug-2022, Manuscript No. MCA-22-18478; **Editor assigned:** 18-Aug-2022, PreQC No. MCA-22-18478 (PQ); **Reviewed:** 06-Sep-2022, QC No. MCA-22-18478; **Revised:** 13-Sep-2022, Manuscript No. MCA-22-18478 (R); **Published:** 20-Sep-2022, DOI: 10.35248/2329-6798.22.10.377.

Citation: Sun J (2022) Mesogenic Groups of Liquid Crystals and Phase Transitions. Modern Chem Appl. 10:377.