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**Area of Research:** Experimental Soft Condensed Matter (Liquid Crystals)

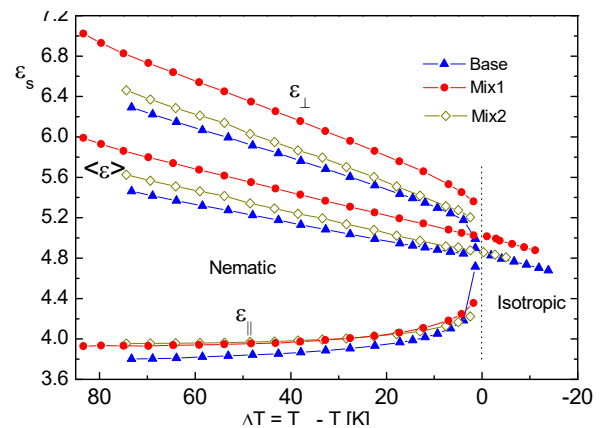
**Expertise:**

- a) X-ray diffraction studies of liquid crystals.
- b) Nuclear Magnetic Resonance Measurements of liquid crystals.
- c) Research and Development of materials for Liquid Crystal Displays.
- d) Physical characterization of Liquid Crystalline materials from optical, elastic constant, dielectric permittivity and magnetic susceptibility measurements.

**Ph. D. Produced – 2 Ph. D. Continuing -1**

**Major Research Projects implemented:**

**Development of liquid crystalline materials with Optimum properties for application in vertically aligned mode liquid crystal displays, DST, New Delhi, 2007-2011 (SR/S2/CMP-29/2007). Total cost: Rs.34,28,000.00**



**Major Research Projects ongoing:**

**Development of Antiferroelectric Liquid Crystalline Materials for Application in Optical Modulators with Symmetric Switching Times (EMR/2016/005001 dated 07.11.2017). Total Cost: Rs. 40,00,000.**

### Key publications:

1. Preparation and study of the electro-optical properties of binary mixtures of orthoconic anti-ferroelectric esters and achiral phenyl pyrimidine liquid crystal, Anamika Pramanik, Malay Kumar Das, **Banani Das** and Roman Dąbrowski, *Soft Materials*, **13**, 201 (2015).
2. Fast switching negative dielectric anisotropic multicomponent mixtures for vertically aligned liquid crystal displays, Prajnamita Dasgupta, Malay Kumar Das and **Banani Das**, *Materials Research Express*, **2**, 045015 (2015).
3. Self-assembling properties of lactic acid derivative with several ester linkages in the molecular core, Anamika Pramanik, Malay Kumar Das, **Banani Das**, Věra Hamplová, Miroslav Kašpar and Alexej Bubnov, *Phase Transitions*, **88**, 745 (2015).
4. Comparative study of the mesomorphic properties of several laterally fluorinated liquid crystalline materials, Prajnamita Dasgupta, Anamika Pramanik, Malay Kumar Das and **Banani Das**, *Liquid Crystals*, **42**, 1083 (2015).
5. Mesomorphic and structural properties of some liquid crystals possessing a bicyclohexane core, Malay Kumar Das, Prajnamita Dasgupta, **Banani Das** and Sudipta Kumar Sarkar *International Journal of Advanced Research*, **3**, 967 (2015).
6. Electro-optical properties of a new series of fluorinated antiferroelectric orthoconic liquid crystalline esters, Anamika Pramanik, Malay Kumar Das, **Banani Das**, Magdalena Źurowska and Roman Dąbrowski, *Liquid Crystals*, **42**, 412 (2015).
7. Mesomorphic, optical, dielectric, elastic and viscous properties of multi-component isothiocyanato mixtures, A. Pramanik, **B. Das**, M. Das, K. Garbat, S. Urban and R. Dabrowski, *Liquid Crystals*, **40**, 149 (2013).
8. Dielectric Permittivity and Viscoelastic Measurements of Two Tricomponent Mixtures Consisting of Laterally Fluorinated Terphenyl Derivatives, S. Basak, P. Dasgupta, **B. Das**, M.K. Das and R. Dabrowski, *Acta Physica Polonica A*, **123**, 714 (2013).
9. Optical, dielectric and visco-elastic properties of a few hockey stick-shaped liquid crystals with a lateral methyl group, Anish Chakraborty, Malay Kumar Das, **Banani Das**, Ute Baumeister, Wolfgang Weissflog, *Journal of Materials Chemistry C*, **1**, 7418 (2013).
10. Rotational viscosity measurements of bent-core nematogens, Anish Chakraborty, Malay Kumar Das, **Banani Das**, Anne Lehmann and Carsten Tschierske, *Soft Matter*, **9**, 4273 (2013).
11. A comparative study of the mesomorphic properties of fluoro-isothiocyanated and fluorinated terphenyl liquid crystals from birefringence, static dielectric permittivity, splay elastic constant and rotational viscosity measurements, M. K. Das, A. Pramanik, **B. Das**, Ł. Szczuciński and R. Dabrowski, *J. Phys. D: Appl. Phys.*, **45**, 415304 (2012).
12. Mesomorphic and structural properties of liquid crystal possessing a chiral lactate unit, **Banani Das**, Anamika Pramanik, Malay Kumar Das, Alexej Bubnov, Věra Hamplova, Miroslav Kašpar, *Journal of Molecular Structure*, **1013**, 119 (2012).
13. Determination of the orientational order parameter of the homologous series of 4-cyanophenyl 4-alkylbenzoate (n.CN) by different methods, Malay Kumar Das, Gautam Sarkar, **Banani Das**, Ratan Rai and Neeraj Sinha, *J. Phys.: Condens. Matter*, **24**, 115101 (2012).
14. New hockey stick compounds with a lateral methyl group showing nematic, synclinic and anticlinic smectic C phases, A. Chakraborty, **B. Das**, M. K. Das, S. Findeisen-Tandel, M.-G. TAMB, U. Baumeister, H. Kresse and W. Weissflog, *Liquid Crystals*, **38**, 1085 (2011).