Biaxial nematics from cross-like mesogens

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The theoretical prediction [1] of biaxial nematics was proposed more than 20 years ago, which have been suggested promising for significant improvements of liquid crystal displays response time and viewing-angle characteristics [2]. With shape biaxiality, board-like nematogens were originally proposed to lead to the N_b phase. In 2012, we have reported the first biaxial nematic phase from cross-like mesogens [3] The theoretically predicted optimum length-breadth-width ratio for maximizing shape biaxiality has been accomplished by the successful synthesis of cross-like 1,2,4,5-tetrasubstituted benzene mesogens which exhibit enantiomeric nematic phase behaviors. Various measurements were conducted for its biaxiality investigations. With similar length-breadth-width ratio, newly designed unsymmetrical cross-like compounds are synthesized and low melting temperatures are achieved for facile biaxiality investigations. Biaxial nematics from other related compounds will also be discussed.

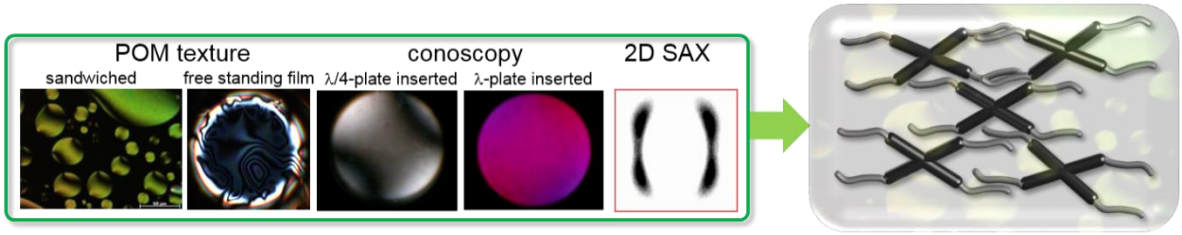

Fig. 1. Biaxial nematic phase from cross-like mesogens.

References

[1] M. J. Freiser, *Phys. Rev. Lett.,* **24**, 1041-1043 (1970).
[2] **a)** R. Berardi, L. Muccioli, C. Zannoni, *J. Chem. Phys.,* **128**, 02490501-02490512 (2008). **b)** D. W. Bruce, *The Chemical Record,* **4**, 10-22 (2004).
[3] **a)** H.-H. Chen, H.-A. Lin, Y.-H. Lai, S.-Y. Lin, C.-H. Chiang, H.-F. Hsu, T.-L. Shih, J.-J. Lee, C.-C. Lai, T.-S. Kuo, *Chem. Eur. J.,* **18**, 9543-9551 (2012). **b)** Lee, S.-L., Wu, H.-J., Hsu, Y.-J., Chen, H.-H., Hsu, H.-F., Chen, C.-H. *Chem. Commun.,* 14093-14096 (2014).

Speaker Biography

Hsiu-Fu Hsu received B.S. degree in Chemistry from National Sun Yat-Sen University, Taiwan, in 1988, and Ph.D. degrees in Chemistry from University of Illinois at Urbana-Champaign in 1997. After a two-year postdoctoral period at Massatusetts Institute of Technology, he has been with the Department of Chemistry, Tamkang University, New Taipei City, Taiwan, where he is currently a Professor. In addition to research publications, he has also written a college general textbook titled ‘Principles of Chemistry‘ (Zumdahl, Decoste, Hsu) in 2014.