

FERROELECTRIC PROPERTY OF BANANA-SHAPED LIQUID CRYSTALS AND THEIR POLYMERS

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Non-conventional LC molecules with banana-shaped mesogens have revealed unique insights into mesomorphism and its associated electro/optic properties. For instance, achiral banana-shaped molecules could generate the chiral smectic mesophase, and bent-core molecules could produce a biaxial nematic mesophase. During a past decade, a considerable number of studies on structure-property relationship for the bent-core mesogen have been reported. On the other hand, so far little attention has been given to study on polymers with bent-core mesogens in the main chain. We are interested in each banana mesogenic unit in a polymer backbone participates in forming the frustrated smectic phase while the polymer chain should adopt the most stable conformation.

In 2002, we first reported the synthesis and properties of the novel main-chain LC polymers with banana-shaped mesogen [1]. In 2003 and 2004, Galli and coworkers reported the metathesis polymerization of the banana polymers consisting of a regular alternation of a banana unit and flexible spacer in the main chain [2]. In 2004, we first reported that the main chain banana polymers could form B phases [1].

In this study, the novel banana-shaped compounds with lateral substituents were synthesized and characterized: mesomorphic and electro/optical properties of the banana-shaped molecules including the switching property such as [anti]ferroelectricity will be described as a model compound. In addition, new semi-flexible polymers with bent-core mesogen in the main chain have been synthesized varying the bend-angle of a central core, and the effects on the LC properties were investigated: mainly the structural investigation of mesophases will be described.

Acknowledgements

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References

- [1] (a) The 19th International Liquid Crystalline Conference, Edinburgh, UK, 2002; (b) E. Choi, J. Ahn, L. Chien, C. Lee, W. Zin, D. Kim, and S. Shin, *Macromolecules*, **37**, 71 (2004).
- [2] (a) S. Demel, S. Slugove, F. Stelzer, K. Fodor-Csorba, and G. Galli, *Macromol. Rapid Commun.*, **24**, 636 (2003); (b) The 20th International Liquid Crystalline Conference, Ljubljana, Slovenia, 2004.

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17:40-18:00 O-6
High efficiency organic solar cells using multi-heterojunction
Yoshiki Kinoshita, Taku Hasobe and Hideyuki Murata (JAIST)

18:30- Welcome Party

19:30- KJF Committee Meeting

October 3 (Tuesday)

Plenary Lecture I

09:00-09:40 PL-1
Organic Crystals for Photonics Applications
Hachiro Nakanishi (Tohoku Univ.)

09:40-10:50 Oral Session III (Properties of Organic Materials and Molecular Memory)

09:40-10:10 I-5 (invited)
Composite of Organic Polymers and Fe(II) Complexes Exhibiting Spin Crossover
S. -H. Jeong, S. -W. Lee, K. -N. Kim, J. -S. Kang, D. -H. Choi, and J. -I. Jin (Korea Univ.)

10:10-10:30 O-7
Ferroelectric Property of Banana-Shaped Liquid Crystals and Their Polymers
E-Joon Choi¹, Wang-Cheol Zin², Young Chul Kim³, Sang-Hyon Paek³, and Jae-Hoon Kim⁴
(Kumoh Natl. Inst. of Tech.¹, Pohang Univ. of Sci. and Tech.², Kyung Hee Univ.³, Hanyang Univ.⁴)

10:30-10:50 O-8
Molecular Memory by Use of Porphyrin-Thioindigo Conjugate
Yoshiaki Kobuke, Joanne Dy, Rena Maeda, Kazuya Ogawa (Nara Inst. of Sci. and Tech.)

10:50-11:10 Coffee Break

11:10-12:20 Oral Session IV (Organic Photonics, Molecular Assembly and Devices)

11:10-11:40 I-6 (invited)
Photo-Modulations and Orientations of Nanostructures in 2D Materials
Takahiro Seki and Shusaku Nagano (Nagoya Univ.)

11:40-12:00 O-9
Molecular Ordering in Self-Organized Dye Particles
Akihiro Tomioka, Shinji Kinoshita and Atushi Fujimoto (Osaka Electro-Communication Univ.)

12:00-12:20 O-10
Carbon Nanotubes in Composite Polymer Guided Wave Mode Device for Ultrafast Molecular Photonics
Toshihiko Nagamura, Jang-Hyun Ryu, Masahiro Shigeta, Naotoshi Nakashima (Kyushu Univ.)

12:20-13:20 Lunch

13:20-15:00 Poster Session I (Odd Numbered Papers)

15:10-16:50 Oral Session V (Organic Transistors and Light-Emitting Diodes)

15:10-15:40 I-7 (invited)
Organic Static Induction Transistors and Application to Logic Circuits
Kazuhiro Kudo¹, Yasuyuki Watanabe² and Hiroyuki Iechi^{2,3} (Chiba Univ.,¹ OITDA,² Ricoh³)