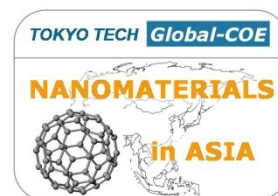




Prof. Junji Watanabe

Graduate School of Science and Engineering
Department of Organic
and Polymeric Materials



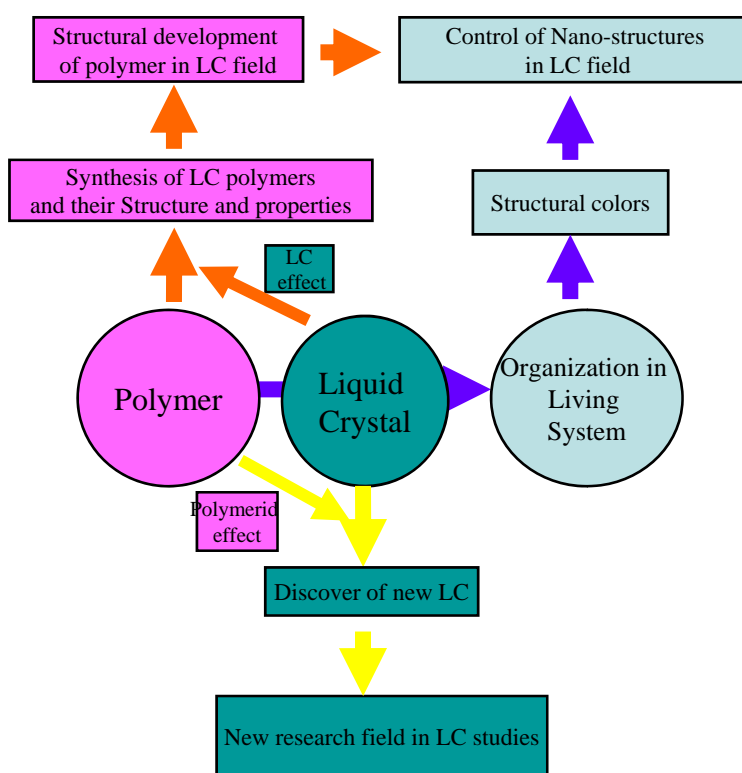
Contact: Tel./Fax: 03-5734-2633; jwatanab@polymer.titech.ac.jp
Lab HP: <http://www.op.titech.ac.jp/gs/watanabe/index.html>

Research field: Science and application of liquid crystals

Research topics conducted within the G-COE project

We are studying on the interplay between polymeric and mesogenic liquid crystalline (LC) effects. The research projects included are planned in the scheme illustrated in right Figure.

- 1) Synthesis of liquid crystalline (LC) polymers, such as main-chain type of LC polymers, side-chain type of LC polymers, rigid-rod aromatic polyesters and polypeptides, and block copolymers.
- 2) Preparation of polymer materials with fine nano-structures which are well-controlled in the LC field.
- 3) Exploitation of new type of liquid crystals by understanding the polymeric effects on LC structures.
- 4) Preparation of structural colors in the biological systems by understanding the LC effects on the organization of polymer materials



Representative publications

1. TEM observation due to surface replica method for layer undulation in solid X1 phase of banana molecule Sungmin Kang, Jun Koki, Masatoshi Tokita and Junji Watanabe, *Jpn.J.Appl.Phys*, 46, 3518-3520 (2007)
2. Unusual nematic liquid crystal with polar Cs symmetry formed from aromatic polyesters with head-tail character, M. Koike, et al., *Macromolecules*, 40, 2524-2531(2007)
3. Chirality Transfer between weakly birefringent and electric-field-induced highly birefringent B2 phases in a bent-core mesogen, S.K.Lee, et al., *J. Phys. Chem. Lett.* 111, 8698-8701(2007)
4. Why Achiral Rodlike Compound with Ester Group Amplifies Chiral Power in Chiral Mesophase S. Kawauchi, et al., *Chem. Lett.*, 36, 750-751 (2007)
5. Relationship between Chemical Structure and Helical Twisting Power in Optically Active Imine Dopants Derived from R-(+)-1-(1-Naphthyl)ethylamine, K. Fukuda, et al., *Jpn.J.Appl.Phys*, 5280-521, 46(2007)
6. Characteristic Shear-Flow Orientation in LC Block Copolymer Resulting from Compromise between Orientations of Microcylinder and LC Mesogen, M. Tokita, et al., *Macromolecules*, 40, 7276-7282(2007)
7. Magentic Potassium Clusters in a Nanographite Host System, K. Takai, et al., *Phys. Rev. Lett.*, 98, 017203(2007).