

Department of Materials Science - CENIMAT / I3N

Liquid crystalline Cellulose networks

Soft and biofunctional Materials Group
at DCM/FCT/UNL and Cenimat / I3N



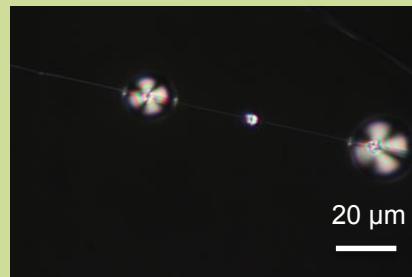
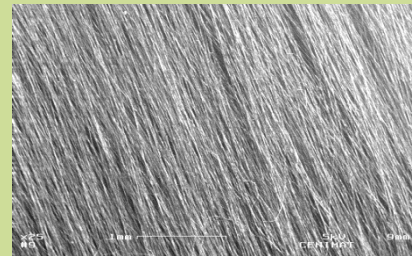
Yong Geng

(Post-doc)

- PhD in Materials Science and Engineering (CENIMAT&DCM New University of Lisbon, 2013)
- M.Sc in Physics (Ludong University & University of Science and technology of China, 2009)
- Current Research Interests: Macromolecular and liquid crystal physics, Liquid crystal and liquid crystalline materials Applications.

Objectives

- Prepare new light modulators from micro/nano cellulosic fibres with dispersed liquid crystal materials. Try to understand the process-structure-property relationship of the cellulose fibers or films and try to make application of this liquid crystal networks and also to understand more about the properties of liquid crystal under different anchoring condition and confinement.
- Preparation of nano/micro cellulosic fibers using electrospinning technology from isotropic and anisotropic solutions.
 - Study the structures of different liquid crystal droplets confined on the electrospun-fibers cellulose fibers with different anchoring conditions.
 - Study the liquid crystalline HPC network system made from an anisotropic solution by casting technology and the structure color of the HPC casted thin film.
 - Study of the liquid crystalline solution by Rheo-NMR at different shear rates.



Methodology

- Using electrospinning technology to make nano/micro fibers.
- Using a casting method we prepare thin films from different solutions.
- Studying liquid crystals (including in droplet shape) under different anchoring condition and confinement.
- Studying the Liquid crystals response do external stimuli including temperature and electric field.
- Physical, chemical, and mechanical characterization of the Networks.
- Electro-optical characterization of light modulators .



Expected Results

- Understand more about the process-structure-property relationship of the cellulose fibers or films and try to come up with applications of this liquid crystal networks.
- Understand more about liquid crystal defects under specific anchoring condition and confinement and their interaction with an external electric field.
- After performing the studies and having optimized the production parameters of these composite materials, prototypes will be produced in order to achieve a possible commercial application of these devices.

