Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Revealing the inner arrangement of cholesteric liquid crystals confined in polymeric electrospun fibers[1] GIUSY SCALIA, Seoul National University, EVA ENZ, MLU Halle-Wittenberg, VERA LA FERRARA, ORONZO CALÓ, ENEA C.R. Portici, JAN LAGERWALL, Seoul National University — Cholesteric liquid crystals, like other types of LCs, can be confined inside polymeric fibers by coaxial electrospinning. In this way the interesting optical properties of cholesterics could be transferred to very long fibers that can form flexible or rigid mats according to the outer sheath material. Selective reflection was easily detected from polymeric fibers with cholesteric LC core. Despite the uniformity of the external morphology of the fibers, evaluated by SEM, defects in the optical texture could be observed in some locations as well as differences in the wavelength of the reflected light. The reason for such differences needs to be clarified in order to achieve a uniform, controlled optical texture. The understanding was achieved by direct observation of the cross section of the LC-filled fibers by cutting and sectioning the fibers by Focused Ion Beam (FIB). This revealed differences in dimensions of the inner cavity correlating them to the observed wavelengths of the selectively reflected light, but also changes in shape, in some parts with strongly varying width that accounts for the defect lines observed. We could also visualize the effect of flow instability of the jet during spinning, inducing the formation of chains of LC droplets.

[1]Research supported by grants from the AICT (SNU, Korea) and NRF(Korea)

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Date submitted: 11 Nov 2011 Electronic form version 1.4