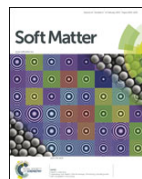


[Log in / register](#)

Issue 6, 2015

[Previous](#)[Next](#)

From the journal:

Soft Matter

Mechanism of electrically induced photonic band gap broadening in polymer stabilized cholesteric liquid crystals with negative dielectric anisotropies



[Hossein Nemati](#),^a [Shiyi Liu](#),^a [Rafael S. Zola](#),^{ac} [Vincent P. Tondiglia](#),^b [Kyung Min Lee](#),^b [Timothy White](#),^b [Timothy Bunning](#)^b and [Deng-Ke Yang](#)^{*a}

Author affiliations

* Corresponding authors

^a Chemical Physics Interdisciplinary Program, Liquid Crystal Institute, Kent State University, Kent, Ohio 44242, USA

E-mail: dyang@kent.edu

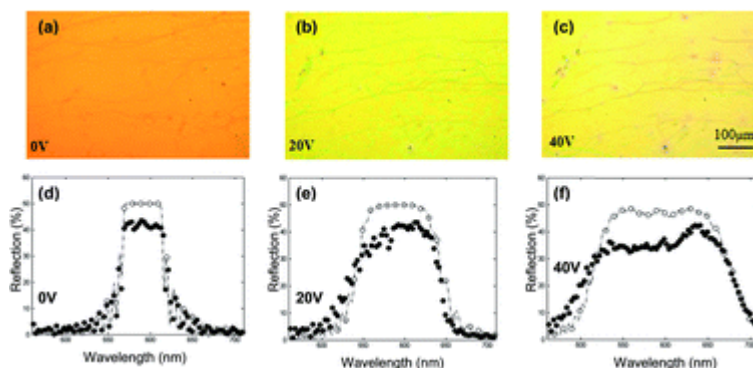
^b Air Force Research Laboratory Materials and Manufacturing Directorate, Wright Patterson Air Force Base, OH, USA

^c Departamento de Física, Universidade Tecnológica Federal do Paraná-Apucarana, PR 86812-460, Brazil

Abstract

We experimentally observed that the photonic band gap (reflection band) of polymer stabilized cholesteric liquid crystals with negative dielectric anisotropies can be greatly broadened under DC electric fields. We explored the underlying mechanism. We found that the dispersed polymer network moved when DC voltages were applied across the liquid crystal cell. The motion of the polymer network stretched the helical pitch of the liquid crystal on one side of the cell and compressed the helical pitch on the other side

of the cell. We proposed a phenomenological theory to explain the motion of the polymer network and the effect of the polymer network on the helical pitch, and this theoretical prediction agreed well with the experimental results.

[About](#)[Cited by](#)[Related](#)

Buy this article

£42.50*

* Exclusive of taxes

This article contains 6 page(s)

Other ways to access this content

Log in

Using your institution credentials

Sign in

With your membership or subscriber account

Article information

<https://doi.org/10.1039/C4SM02283A>

Submitted

17 Oct 2014

Accepted

11 Dec 2014

First published

11 Dec 2014

Citation

Soft Matter, 2015, **11**, 1208-1213

BibTex



Go

Article type

Paper

Author version available

[Download author version \(PDF\)](#)

Permissions

[Request permissions](#)

Social activity

Tweet

Share

Search articles by author

- ☐ Hossein Nemati
- ☐ Shiyi Liu
- ☐ Rafael S. Zola
- ☐ Vincent P. Tondiglia
- ☐ Kyung Min Lee
- ☐ Timothy White
- ☐ Timothy Bunning
- ☐ Deng-Ke Yang

[Go](#)

Spotlight

Advertisements

» Journals, books & databases



- Home
- About us
- Membership & professional community
- Campaigning & outreach
- Journals, books & databases
- Teaching & learning
- News & events
- Locations & contacts
- Careers
- Awards & funding
- Advertise
- Help & legal
- Privacy policy
- Terms & conditions



© Royal Society of Chemistry 2021

Registered charity number: 207890