

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Highly Viscous Cholesteric Mixtures: New Domain of Responsive Materials PETR SHIBAEV, ROBERT UHRLAS, SEAN WOODWARD, CRISTINA SCHLESIER, Fordham University — Recently, considerable efforts were directed towards design and study of cholesteric elastomers that could respond reversibly to different types of deformation by changing helical pitch and keeping these changes in the deformed state. The alternative approach to design mechanically responsive cholesteric materials would be the use of highly viscous cholesteric mixtures that display a viscoelastic behavior.¹ In this presentation we review our recent results in designing novel viscoelastic cholesteric materials and show that some of their properties are superior to those of cholesteric elastomers. Gigantic color changes and tunable lasing displayed by highly viscous cholesteric materials are discussed in detail and the model describing mechanically induced shift of the selective reflection band is presented. The ways of increasing hydrophilicity of these novel materials that make them attractive for designing environmentally sensitive sensors are also considered and the design of novel pH sensors is presented. At the end, the properties of highly viscous cholesteric mixtures that bring them to the domain of novel responsive materials are discussed.

¹Petr V. Shibaev *et. al.*, Opt. Express **16**, 2965-2970 (2008)

Petr Shibaev
Fordham University

Date submitted: 30 Nov 2009

Electronic form version 1.4