

Kerr effect in vertically aligned deformed helix ferroelectric liquid crystals

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We disclose the vertically aligned deformed helix ferroelectric liquid crystal (VADHFLC) whose Kerr constant ($K_{kerr} \sim 144 \text{ nm/V}^2$ at $\lambda = 543 \text{ nm}$) is one order of magnitude higher than any other value previously reported for liquid crystalline structures. Under certain conditions, the phase modulation with ellipticity less than 0.05 over the range of continuous and hysteresis free electric adjustment of the phase shift from zero to 2π have been obtained at sub-kilohertz frequency. (fig. 1)

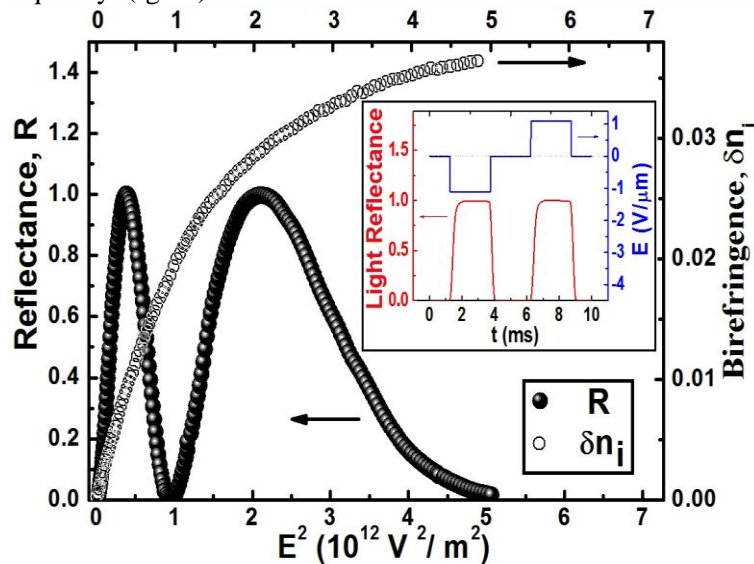


Fig. 1. Dependence of the light reflectance of a 18 μm thick VADHFLC cell on square of electric field E^2 (Solid circles). Measurements were carried out in the reflective mode with crossed polarizer and analyzer at temperature 55 $^\circ\text{C}$, wavelength $\lambda = 632.8 \text{ nm}$, electro optical response frequency 500Hz and Insert: Electro optical response of the VADHFLC cell (red curve at the bottom) under the applied alternating signal (blue curve on the top).

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Reference

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