

ELECTROOPTICAL AND NONLINEAR OPTICAL  
PROPERTIES OF LYOTROPIC LIQUID CRYSTALS  
DOPED WITH ELECTROCHROMIC VIOLOGENS

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S u m m a r y

This work presents the results of experimental studies of the electrooptical and nonlinear optical properties of lyotropic ionic liquid crystals (LILC) with soluted electrochromic admixtures of viologens. It is established that the Smectic A ordering of the LILC of potassium caprylate is not disrupted by the introduction of viologens. Moreover, LILC-viologen composites obtain electrochromic properties inherent to viologens, which produce colored radical cations and dimers, while reducing. The presence of radical cations and dimers is fixed by the optical absorption spectra. It is found that, under the action of an electric field, the LILC-viologen samples form a bilayer structure consisting of a liquid crystal layer and an absorptive layer of viologen redox products (radical cations and dimers). A dynamic grating recording is realized and studied in bilayer LILC-viologen cells. It is determined that the recording takes place in the colored layer of viologen redox products. A possible mechanism of grating recording in LILC-viologen cells is proposed.