

Photoalignment of Liquid Crystals on Chalcogenide Glassy Films

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First observation of photoaligning of nematic liquid crystals (LC) on inorganic films, namely on a chalcogenide glassy films is reported. We found that irradiation of chalcogenide surfaces by visible laser beam of low-power (~ 30 mW) results in efficient reorientation of the director in the irradiated areas. The anchoring energy associated with the light-induced easy orientation axis is of the order $10^{-6} \text{ J} \cdot \text{m}^{-2}$ that is typical for standard organic polymer photoaligning materials. The surprise is that the direction of the reorientation depended on the time of the exposure. For short exposures director reoriented toward the polarization of light and longer exposures resulted in the reorientation away from the light polarization. The effect of light-induced alignment was used for recording of the surface-mediated electrically controlled holograms in the LC cell.

Keywords: Anisotropy; chalcogenide glassy; liquid crystal; photoalignment

INTRODUCTION

Alignment of a liquid crystal in a cell by irradiation of photosensitive polymer aligning layers with polarized light was found in the end of 25

The work was supported by the Grant of Joint Israeli–Ukrainian Program “Development of advanced photosensitive materials for alignment of liquid crystals and their application in adaptive micro-lens array technology”. The authors are grateful to D. Fedorenko, A. Iljn, E. Ouskova, I. Janossy and T. Kosa for useful discussions and advices.

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