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Reorientation and isotropisation of liquid crystals induced by gas diffusion. ANTHONY TANTILLO, Fordham University Department of Physics, PETR SHIBAEV, Fordham University, Department of Physics — Reorientation and isotropisation of liquid crystals induced by organic solvent vapors was studied experimentally in relation to the use of liquid crystals as gas sensors. Reorientation and isotropisation were studied in the droplets deposited on the flat surface and on the tip of the hollow fibers. The anisotropy of gas diffusion was studied in the films and droplets of different sizes deposited on the surfaces with planar and homeotropic conditions. It was revealed that the diffusion coefficients differ approximately by a factor of two for liquid crystals in planar and homeotropic orientations. It was also shown that interference pattern created by passing light in liquid crystalline droplets deposited on the planar surface and on the tip of the hollow fiber can be used in detection of very small concentration of vapors. The model of diffusion is suggested and molecular dynamics simulations of the diffusion in liquid crystals with different molecular orientation are performed. The molecular dynamics simulations were performed on a time scale of about tens nanoseconds. In general they confirm the experimental results, but provide larger differences (by a factor 2 to 4) for diffusion coefficient in liquid crystals with planar and homeotropic orientation.

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