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Preparation of liquid crystal elastomers and study of their mechanical and optical properties

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Liquid crystal elastomers (LCEs) are a special class of materials that combine the flexibility of elastomers with the ordered structure of liquid crystals. These materials have polymer chains that are linked to liquid crystal molecules, which align in specific directions, creating a unique combination of properties. LCEs can stretch and bend like elastomers, but they also respond to external stimuli (like temperature or electric fields) by changing shape.

We have developed a technology for preparing liquid crystal elastomers and established a laboratory for their preparation. We are conducting studies of the mechanical and orientational properties of LCEs prepared in the newly established laboratory. In particular, we are studying the dependence of the Young's modulus and Poisson's ratio of elastomers on the concentration of elastomer components, temperature, as well as the dependence of optical properties of elastomers from the perspective of using them as waveplates.

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