Dynamic Aspect of Electro-Opto-Mechanical Effects in Swollen Nematic Elastomers

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The optical and mechanical rise times (in response to field-on) decrease in nearly proportion to the square of field strength, while the corresponding decay times (in response to field-off) are almost independent of field strength. The optical rise and decay times are about one order of magnitude smaller than the mechanical ones. We also propose a minimal model to describe the main features of both static and dynamic characteristics of this phenomenon observed experimentally. 1) Urayama, K., Honda, S., Takigawa, T., Macromolecules, 2006, 39, 1943. 2) Fukunaga, A., Urayama, K., Takigawa, T., DeSimone, A., Teresi, L., Macromolecules, in press.