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Photomechanical mechanism and structure-property considerations in the generation of photomechanical work in glassy, azobenzene liquid crystal polymer networks KYUNG MIN LEE, Air Force Research Laboratory, Wright-Patterson AFB, NELSON TABIRYAN, BEAM Engineering for Advanced Measurements Company, TIMOTHY BUNNING, TIMOTHY WHITE, Air Force Research Laboratory, Wright-Patterson AFB — Azobenzene-containing polymeric materials have shown shape adaptive responses when irradiated with light. We contrast the photogenerated mechanical response of glassy, polydomain azobenzene liquid crystal polymer networks (azo-LCN) upon exposure to either UV or blue-green irradiation. The profound differences in the fundamental photomechanical response to exposure to light in these wavelength regimes are dictated by distinctive photochemical mechanisms, elucidated through UV/VIS spectroscopic examination of the materials before and after irradiation with UV and blue-green light. The glassy, photoresponsive polymeric materials were subjected to structure-property examination to ascertain the role of crosslink density, azobenzene concentration, and azobenzene connectivity (crosslinked or pendant) on the photomechanical output.

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