

Abstract Submitted  
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**High and Stable Light Induced Birefringence from Spacer-Free Dye-Polyelectrolyte Liquid Crystal Complexes**<sup>1</sup> QIAN ZHANG, C. GERALDINE BAZUIN, University of Montreal, CHRISTOPHER J. BARRETT, McGill University, CHRISTIAN PELLERIN, University of Montreal — Azo materials are promising in photonic applications due to the well-known photoisomerization of azo groups, which, for example, allows efficient inscription of gratings using light induced birefringence (LIB). The incorporation of liquid crystal (LC) character in these materials can be desirable to improve LIB properties, such as in side chain liquid crystal polymers (SCLCPs). However, SCLCPs are costly, and flexible alkyl spacers tend to diminish LIB properties. Here, we present LC azo materials obtained by simple ionic complexation procedures involving commercially available (or easily synthesized) dyes and oppositely charged polyelectrolytes; for example methyl orange (MO) and methylated poly(4-vinyl pyridine) (PVPM). The latter complex, which possesses neither flexible spacer nor tail, has a single-layer smectic A-like structure until degradation and provides exceptionally high and stable LIB properties. These materials can be inscribed with surface relief gratings. Moreover, we have successfully obtained a photoresponsive electrospun mat from a solution of the MO/PVPM complex mixed with poly(ethylene oxide).

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