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Quadratic Electro-optic Effect in a Novel Nonconjugated Conductive Polymer, iodine-doped Polynorbornene ANANTHAKRISHNAN NARAYANAN, MRINAL THAKUR, Photonic Materials Research Laboratory, Auburn University, AL — Quadratic electro-optic effect in a novel nonconjugated conductive polymer, iodine-doped polynorbornene has been measured using field-induced birefringence at 633 nm. The electrical conductivity[1] of polynorbornene increases by twelve orders of magnitude to about 0.01 S/cm upon doping with iodine. The electro-optic measurement has been made in a film doped at the medium doping-level. The electro-optic modulation signal was recorded using a lock-in amplifier for various applied ac voltages (4 kHz) and the quadratic dependence of the modulation on the applied voltage was observed. A modulation of about 0.01% was observed for an applied electric field of 3 V/micron for a 100 nm thick film The Kerr coefficient as determined is about $1.77 \times 10^{-11} m/V^2$. This exceptionally large quadratic electro-optic effect has been attributed to the confinement of this charge-transfer system within a sub-nanometer dimension. 1. A. Narayanan, A. Palthi and M. Thakur, J. Macromol. Sci. – PAC, accepted.

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