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Synthesis, characterization and determination of third-order optical nonlinearity by cw z-scan technique of novel thiobarbituric acid derivative dyes

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Abstract

Donor acceptor chromophores were prepared by Knoevenagel reaction of 1,3-diethyl-2-thiobarbituric acid with corresponding aldehydes in ethanol using pyridine as catalyst. The structures of newly synthesized compounds were evaluated by FT-IR, H-1 NMR, C-13 NMR, MS spectroscopy and purity of the compounds were confirmed by elemental analyses. The nonlinear refractive index $n(2)$ and nonlinear absorption coefficient β are measured for these dyes using the closed and open aperture z-scan technique with a cw He-Ne laser at 632.8 nm. These values are found to be high and linearly dependent on the concentration. (C) 2015 Elsevier B.V. All rights reserved.

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