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Surface morphology and thermal figure of merit of a new compound thin film

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Article
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Abstract

The third nonlinear optical properties of a new compound 4,4′-bis(3-methoxy benzylidene amino) biphenyl doped poly-methyl methacrylate (PMMA) have been studied using Z-scan technique. Experiments are performed using a continuous waveguide (cw) diode laser at 532 nm wavelength and 0.68 kW/cm^2 laser intensity. The optical power limiting behavior of sample doped PMMA was also investigated. It also shows a very good optical limiting behavior with a limiting threshold of 4.7 mW. We attribute the nonlinear absorption and optical limiting property of the sample film to two photon absorption effect at 532 nm. The experimental evidences of observing diffraction pattern in compound 4,4′-bis(3-methoxybenzylideneamino) biphenyl doped PMMA has been present. The refractive index change, Δn, and nonlinear refractive index, n_2 determined from the number of observed ring. We obtained good values of $\Delta n = 105.154 \times 10^{-4}$and $n_2 = 154.154 \times 10^{-7}$ cm^2/W. Variation of refractive index with temperature, dn/dT, and figure of merit, H, are found to be 8.858×10^{-6}

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