Linear and nonlinear optical absorption characterization of natural laccaic acid dye

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Résumé en anglais	We report on the optical performances of laccaic acid dye in solution at different concentrations and dye–poly(methyl methacrylate) composite thin films. The linear spectral characteristics including optical constants, i.e. refractive index (n) and extinction coefficient (k), were carried out in a comprehensive way through absorbance, fluorescence and ellipsometric studies. The nonlinear optical parameters such as nonlinear absorption coefficient β_{eff} (or β_2), the imaginary third-order susceptibility (Im[$\chi^{(3)}$]) and the imaginary part of second-order hyperpolarizability (γ) of the samples were evaluated using the open-aperture Z-scan technique with a laser pulse duration of 10 ns at 532 nm wavelength. The corresponding numerical values of these parameters were of 10^{-10}, 10^{-11} and 10^{-32} order, respectively. Two-photon absorption was revealed to be the main driving physical mechanism in the nonlinear response. This suggests that laccaic acid dye can be a potential candidate for NLO materials application.
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