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The nonlinear optical properties of two dihydropyridones derived from curcumin

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Two dihydropyridone compounds are synthesized from curcumin using microwave radiation. Both compounds were identified by their melting points and ¹HNMR spectra. The nonlinear properties viz., nonlinear absorption coefficients and nonlinear refractive index of both compounds were calculated at wavelength 473 nm using the diffraction ring patterns and Z-scan techniques separately. The diffraction ring patterns evolved from circular symmetric to asymmetric due to convection current in the vertical direction. As a result of using Gaussian laser beam, the Fraunhofer approximation of the Fresnel–Kirchhoff diffraction, have led to successful simulation of the diffraction ring patterns with good quantitative and excellent qualitative agreements compared with experimental results. Optical limiting property has been tested in both compounds.

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1. Introduction

studied extensively. The photophysical, photochemical, and photobio-