

Insight into nonlinear third order susceptibility measurement and optical limiting nature of 8-hydroxyquinolinium hydrogen fumarate single crystal

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The NLO third order characteristics for 8-hydroxyquinolinium hydrogen fumarate (8HQF) compound were estimated by a diode pumping second harmonic CW Nd:YAG laser (532 nm) by utilizing Z-scan method. The resultant value with its magnitude for nonlinear refractive index was $8.64 \times 10^{-8} \text{ cm}^2 \text{ W}^{-1}$, nonlinear absorption coefficient was $0.08 \times 10^{-4} \text{ cm W}^{-1}$ and the third order nonlinear susceptibility was found to be $15.28 \times 10^{-6} \text{ esu}$. A negative nonlinearity of 8HQF proves it to be a self de-focusing nature and this to be the reason for exhibiting optical limiting nature.

Keywords: Z-scan, self de-focusing, optical limiting.