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# The concentrations and thickness effects of R6G dye on the nonlinear optical properties at low intensity

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**Abstract:**As technology advances, optics will play an enormous role in a broad range of commercially available devices and medical instrumentation. Learning about the optical effects of R6G dye will provide further insight to some of the challenges the optical industry will face in the future. This study of nonlinear optical (NLO) properties of Rhodamine 6G dye doped epoxy resin polymer is analyzed at 532 nm using a continuous wave laser. Evaluating the sign and magnitude of the nonlinear refractive index from the closed aperture Eclipsing Z-scan technology (EZ) while the nonlinear absorption coefficients were assessed using the open aperture EZ-scan. We observed that the NLO properties of the dyes doped in epoxy resin are affected by the dye concentration and the sample thickness. The sample shows Reverse Saturable Absorption (RSA) behaviour in case open EZ-scan, while in case close Z-scan both Self-focusing and self-defocusing were observed.

**Keyword:** Nonlinear properties, Eclipsing Z-scan, Rhodamine dye, Epoxy resin.

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