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## Nonlinear Optical Properties of Rose Bengal: Effect of Environment

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Abstract:

The dye with strong two photon absorption (2PA) at low concentration has application in Photodynamic therapy. For this reason, the nonlinear optical properties of Rose Bengal in various solvents, water-surfactant solution and water-in-ionic liquid microemulsion (MEs) was studied by Z-scan technique with a CW Diode laser at 532nm wavelength and 50mW power to study the effect of environment on Rose Bengal (RB). The dipole moment of RB in MEs was determined by using a spectrophotometer and fluorometer and the quantum perturbation theory. The results disclose that the nonlinear refractive index and 2PA of RB reduce with the increase of dielectric constant of the medium. Moreover, the NLO properties and dipole moment of RB depend on the formation of anionic surfactant and MEs.

**Keywords:** Rose Bengal, Two Photon Absorption, Nonlinear Optic, fluorescence, nano-droplets, dipole moment.

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