

# SYNTHESIS AND STUDY OF NONLINEAR OPTICAL PROPERTIES OF A NEW AZO DYE BY Z-SCAN TECHNIQUE

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## ABSTRACT

The single beam Z-scan technique was used to determine the nonlinear optical properties of the new azo dye [4-(2-hydroxy naphthylazo)phenyl][2-(2-methoxy benzylideneamino)-5-methylphenyl] tellurium dibromide dye in the solvent chloroform and a dye doped polymer film. The experiments were performed using cw SDL laser with a wavelength of 532 nm. This material exhibits a negative optical nonlinearity. The dye exhibited a nonlinear refractive index ( and  $\text{cm}^2/\text{W}$  in dye solution and polymer film, respectively), nonlinear absorption coefficient ( and  $\text{cm}/\text{W}$  in dye solution and polymer film, respectively). Optical limiting characteristics of the dye solution and polymer film were studied. The result reveals that [4-(2-hydroxy naphthylazo)phenyl] [2-(2-methoxy benzylideneamino)-5-methylphenyl] tellurium dibromide dye can be a promising material for optical limiting applications.

**KEY WORDS:** Nonlinear optics, nonlinear refractive index, Z-scan technique, optical limiting.