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Synthesis, Fluorescence and Nonlinear Optical Properties of Phthalocyanine Derivatives in the Continuous-wave and Pulsed Excitation Regimes*

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In this work, the photo-physical properties of seven different phthalocyanine derivatives are studied, with a focus on their transparency spectral range. Two compounds among them are recently synthesised. The investigations include synthesis, photoluminescence, absorptive and refractive nonlinear properties, and optical limiting performances. The compounds are found to be emitting interesting broad fluorescence bands in the visible range. The nonlinear optical properties are investigated with the help of Z-scan technique, with both a continuous laser at 488, 514.5 and 632.8 nm, and with a pulsed laser at 532 nm. The sign and the magnitude of the nonlinear refractive index, third-order susceptibility, and nonlinear absorption coefficient have been evaluated in the seven compounds. The optical limiting performance of each compound was also evaluated in the continuous and pulsed laser excitation regimes.

Keywords: phthalocyanine derivatives, synthesis, fluorescence, nonlinear optical properties.

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