



# Arylmethylene-1,3-indandione based molecular glasses: Third order optical non-linearity

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| Résumé en anglais   | <p>The synthesis and new optical features of three indan-1,3-dione class structures is reported. The simple arylmethylene-1,3-indandione structure 2-(4-diethylaminobenzylidene)indan-1,3-dione was used to design two linked structures: 1,3-bis-{3-hydroxy-4-[4-diethylamino-1-(1,3-dioxoindan-2-ylmethylene) benzen-3-yloxy]-1-thiabuthyl}benzene and 4,4-bis-({3-hydroxy-4-[4-diethylamino-1-(1,3-dioxoindan-2-ylmethylene)benzen-3-yloxy]-1-thiabutyl}phenyl)sulfide. In contrast to the simple compound, which readily crystallized, the linked derivatives remained in an amorphous phase and are considered as molecular glasses with respective glass transition temperatures 88 and 100 degrees C. For non-linear optical investigations samples were prepared as a guest-host system in polycarbonate matrix (10%). The Maker-fringe technique was used to investigate the third harmonic generation at a wavelength of 355 nm (YAG laser). Third-order non-linear susceptibility <math>\chi^{(3)}</math> values were extracted 5.75.10(-21) m(2) V-2, 8.60.10 (-21) m(2) V-2, 16.85.10(-21) m(2) V-2 for these respective indandiones while modeling the experimental results. To evaluate the susceptibility of the indan-1,3-dione derivatives third harmonic generation a comparative experiment for a reference azodye in polycarbonate was performed. The results show an important feature - higher molecular second order hyperpolarizability for the linked structures. NMR, MS, IR, UV-VIS, XRD and elemental analysis were used to structurally characterize the new compounds and ellipsometry was applied to interpret the non-linear optical results.</p> |
| URL de la notice    | <a href="http://okina.univ-angers.fr/publications/ua3181">http://okina.univ-angers.fr/publications/ua3181</a> [21]   |
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