



Synthesis and functionalization of coumarin-containing copolymers for second order optical nonlinearities

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Résumé en anglais	<p>The second-order nonlinear optical properties of photocross-linkable coumarin-based copolymers were investigated using the optical second harmonic generation (SHG) with the Maker fringes technique. High quality and transparent spin-deposited thin films of various methacrylic copolymers containing 4-methylcoumarin pendant chromophores were prepared and the coumarin units were ordered and oriented by the corona poling technique. Nonlinear optical investigations were performed using a picosecond Q-switched Nd:YAG laser working at the fundamental wavelength ($\lambda = 1064$ nm) and the second order nonlinear optical susceptibilities of the functionalized polymers were determined. The samples were irradiated using two wavelengths ($\lambda = 254$ nm and $\lambda = 300$ nm) promoting the reversible photo-induced dimerisation of coumarin moieties within the film. The latter is shown to have a significant impact on the nonlinear optical response of the corresponding material. A large SHG response of photocross-linkable coumarin-based copolymers is obtained.</p>
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