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Photochromism of 5-styryl coumarins: potential utility as memory media

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Photochromism, the reversible transformation between two molecular forms that have different absorption spectra, resulting from photo-irradiation, has applicability in several fields including light modulation materials, optical recording materials, optical switches and photochromic ink.[1] The switching from one molecular state to another is dependent upon the efficiency of light absorption by the chromophore. In recent years we have devoted some interest to the study of coumarin chromophores, with special emphasis on their synthesis and photophysical properties.[2] Our previous result on 3-styryl coumarins shown a promising fluorescent behavior, prompted us to study a new styryl coumarin family. Here we present the synthesis of a new coumarin family **1** with increased extension of the π-delocalized system of the chromophore at the 5-position (Fig. 1). Theoretical calculations (DFT) support our experimental findings where electron excitation leads to a reduction of the electron density around the C=C double bond and a reduction of the rotational barrier in the excited state. Likewise, simulated UV spectra shows maxima at 266, 300 and 335 (Fig. 1) which are consistent with the maxima observed experimentally at 269, 308 and 360. The synthesized compounds present *E-Z* isomerization around the carbon-carbon double bond which can potentially be envisaged to be used as a memory media.

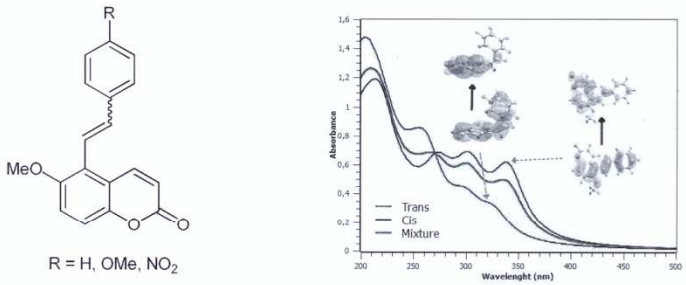

Figure1

Acknowledgments
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