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# MULTIADDRESSABLE PHOTOPHYSICAL PROPERTIES OF PHOTOCROMIC DI AND TETRAHYDROINDOLIZES WITH POTENTIAL APPLICATIONS

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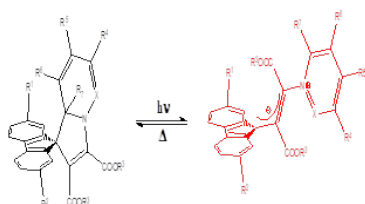
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Nowadays, numerous branches of photochemistry have been discovered and the study of the phenomenon of color change of organic compounds known as photochromism phenomenon become one of the most important branches of photochemistry. This is due to their potential importance in lenses industry, thin-film, security inks, high density information storage, dye-sensitized solar cell (DSSC), computer chips, imaging optics as well as in medicine such as dental filling technology. Their important applications motivated us to continue our investigation in this field. In this research project, we aimed to synthesize and study the photochromic behavior of di- and tetrahydroindolizes photochromes. Many chemical and photochemical pathways will be followed in order to get over the synthesis problems. Various physical properties such as kinetics, solvent effect, gelations, photodegradation, fluorescence, and many other multiaddressable properties are discovered. We expect that the synthesized compounds will show a wide range of absorption in the UV region, as well as visible light and also have a wide range in the half-life, allowing these series of compounds to have numerous applications in many industrial fields. Irradiation of the photochromic dihydroindolizine (DHIs) with polychromatic light led to ring opening colored betaines which undergo thermal 1, 5-electrocyclization. The kinetic of the thermal 1, 5-electrocyclization was studied by using multichannel FT/UV-VIS spectrophotometer. In addition, some studies on the influence of the substituents on both the DHI and THI regions which is fluorene (A), ester (B) and the heterocyclic base (C) on the photochromic properties which have a significant penetrate in the kinetic properties. From these standpoints and from our experience in this area, we expect that, this work opens a new era in the field of chemistry and photochemistry as well.

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**Figure 1:** Photo-induced ring opening of the photochromic THI (closed form) to colored betaine (open form) based 1, 5-electrocyclization