SYNTHESIS, ABSORPTION AND FLUORESCE SPECTRA OF 10-HYDROXYDECAHYDROACRIDIN-1,8-DION DERIVATIVE

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In this paper we present data on the synthesis, absorption and fluorescent spectra of 10-hydroxy-3,3,6,6-tetramethyl-9-(4-hydroxyphenyl)-1,2,3,4,5,6,7,8,9,10-decahydroacridin-1,8-dion. The studied compound was obtained by ecologically safe method. This dye absorbs in the UV - violet (391 nm) region. In alcohol solution its fluo-rescence spectrum shows two emission bands in the blue-green (468 nm) and red-purple (680 nm) region. First band disappears upon addition of a base in solution. Therefore, this compound is of interest as a possible probe for study-ing biological molecules and supramolecular structures.

Keywords: organic synthesis, 10-hydroxy-3,3,6,6-tetramethyl-9-(4-hydroxyphenyl)-1,2,3,4,5,6,7,8,9,10-decahydroacridin-1,8-dion, absorption and fluorescent spectra.

Here in we wish to report our results on synthesis and study of the absorption and fluorescence spectra of 10-hydroxy-3,3,6,6-tetramethyl-9-(4-hydroxyphenyl)-1,2,3,4,5,6,7,8,9,10-decahydroacridin-1,8-dion (N, Fig. 1). The investigated substance was obtained by three-component heterocyclization of dimedone, hydroxylamine hydro-chloride with 4-hydroxybenzaldehyde in water solution using sodium dodecyl sulfate as catalyst.

Obtained compound display in the UV absorption spectrum long-wavelength band at λmax. 391 nm. Addition of alkali induces red shift of absorption maxima to λmax. 502 nm; therefore this compound can be used as acid-base indicator. Irradiation of solution of this substance in alcohol (λmax. 370 nm) induces fluorescence at λmax. 468 and λmax. 680 nm. First band disappears upon addition of a base in solution. Irradiation of basic solution (λmax. 500 nm) induces fluorescence at λmax. 680 nm. The presence of two bands in the fluorescence spectrum of hydroacridinedion (N) in a neutral medium can be explained by its dissociation in an excited state and its transformation into an anion A, just like in an alkaline solution. The long-wavelength band at 680 nm corresponds to the emission of an excited anionic form A*.

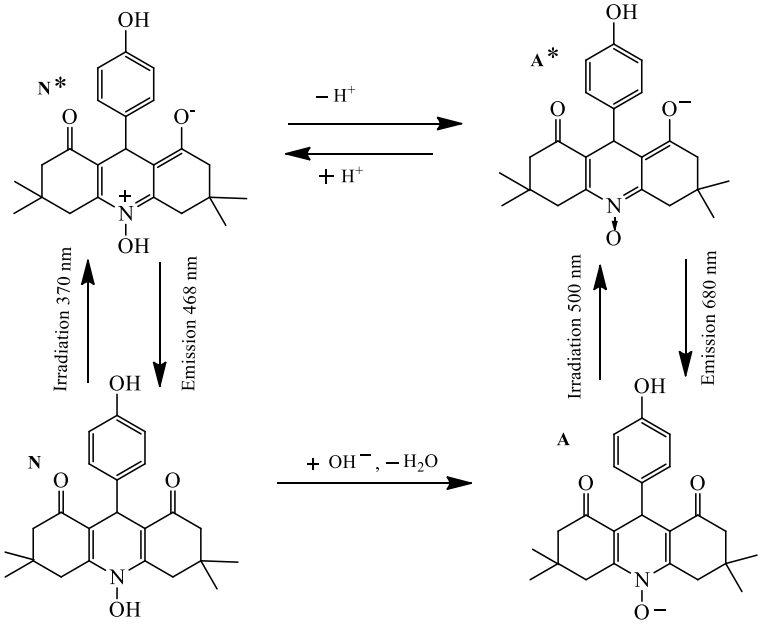

Fig. 1. – Scheme of transformation of 10-Hydroxy-3,3,6,6-tetramethyl-9-(4-hydroxyphenyl)-1,2,3,4,5,6,7,8,9,10-decahydroacridin-1,8-dion upon absorption electromagnetic radiation

Since obtained hydroacridindion shows two emission bands in the visible region of fluorescent spectrum, it is of interest as a fluorescent probe for studying biological molecules and supramolecular structure.