

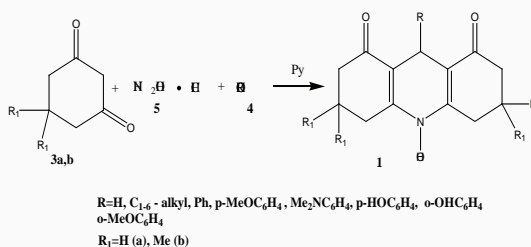
## TITLE

### Synthesis and determination of dissociation constants of hydroxydecahydroacridinediones - acid-base titration indicator

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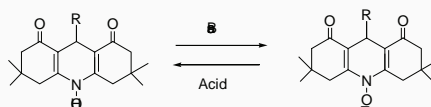
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Earlier, we described the method synthesis of 10-hydroxy-1,2,3,4,5,6,7,8,9,10-decahydroacridine-1,8-diones (1) by the reaction of cyclohexane-1,3-diones (3a,b), hydroxylamine (5) and aldehydes (4) in dry pyridine [1]:



Second method of synthesis of this substances based on the reaction of cyclohexane-1,3-diones and oximes in dry pyridine or acetic acid. This substances are colorless in acidic and neutral and pink in base solutions. That is why they can be suitable acid-base titration indicator.

In the UV spectra of hydroxydecahydroacridinediones (I) there is long-wave absorption band (384 - 406 nm), which maximum offset in the region of 483 - 509 nm when added to a solution of the base, which defines the possibility of the use of these compounds as indicators base media. It is obvious that the painted is the main form of (II), formed as a result of the tear-off of a proton from the acidic form (I).



I II R = Alkyl, Aryl

By measuring the change in the optical density of absorption, proportional to the concentration of the painted forms (II) depending on the pH-value of water or water-alcohol solutions of several hydroxydecahydroacridinediones (I), we calculated the values of acid dissociation constant ( $K_{Ind}$ ) of these compounds, which allows you to set the color changing pH range of the indicator. It is determined by the value of the constants:  $\Delta pH_{Ind} = pK_{Ind} \pm 1$ . The calculation of the  $K_{Ind}$

conducted by the formula:  $K_{Ind} = \frac{[H^+]_2 \cdot A_2 - [H^+]_1 \cdot A_1}{A_1 - A_2}$ , where  $[H^+]_1$ ,  $[H^+]_2$  - molar concentration

of protons two measurements;  $A_1$  and  $A_2$  - corresponding to the concentration of the density of the absorption of long-wave maximum (483 - 509 nm) absorption anion (II).

Alcohol solutions, obtained derivatives 10-hydroxy-1,2,3,4,5,6,7,8,9,10-decahydroacridine-1,8-diones (I) are used as indicators of acid-base titration.

1. A.N. Pyrko. Russian Journal of Organic Chemistry. 2008. Vol. 44, N. 8. P. 1227 - 1236.

### Biography

Pyrko Anatolij Nickolaevich was born in 1950. In 1972 he graduated from Chemistry Department of the Belarussian State University. During the period of 1972 - 2007, he was working at the Institute of Bioorganic Chemistry (Belarussian Academy of Sciences) as junior researcher, researcher and senior researcher. Since 2007, he has been working at the International State Ecological University as sub-professor. Ph.D. since 1988. Field of scientific interests is synthesis of poly- and heterocyclic biologically active compounds.

Publications: over 50 scientific articles among which there are a number of works devoted to the synthesis of steroids and their heterocyclic analogues (1977, 1984, 1990), synthesis of new derivatives of decahydrophenanthridine-1,7-diones and hexahydroisquinolines (1983, 1990, 1992), synthesis and chemical properties of tetra- and octahydrothanthene derivatives (1996) and decahydroacridinediones (1999, 2002, 2003, 2005, 2008).