

2-ARYL-3-HYDROXYQUINOLONES – A NEW CLASS OF THE DYES WITH DUAL FLUORESCENCE

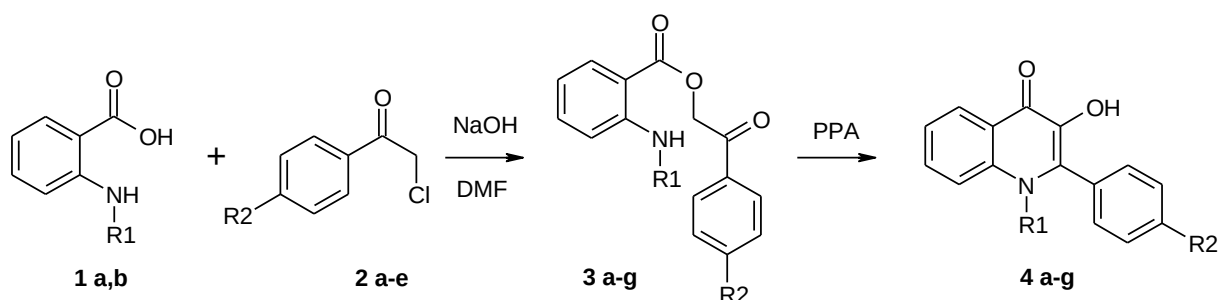
Dmytro Yushchenko¹, Vasyl G. Pivovarenko¹ *Sule Öncül* and Alexander P. Demchenko²

¹ Kyiv National Taras Shevchenko University Chemistry Faculty, Kyiv, 01033, UKRAINE

² TUBITAK Institute for Genetic Engineering and Biotechnology, Gebze-Kocaeli, 41470, TURKEY

There are several classes of dyes known to exhibit dual fluorescence due to Excited State Intramolecular Proton Transfer (ESIPT) effect. Among all, 3-hydroxyflavones (flavonols, 3HF) are the most famous ones. They are the derivatives of natural compounds available in the plants. It was shown that flavonols are very prospective dyes in designing multiparametric fluorescent probes to study the properties and nature of lipid membranes, micellar constructions and various electrostatic effects in molecular level in homogeneous liquid medium.

Despite their important features, flavonols and other fluorescent dyes based on the structure of 3-hydroxychromone unit have several disadvantages that limit their wider application. The main one is their lower photostability. To overcome the disadvantages, we started a work on the development of a series of 2-aryl-3-hydroxyquinolones (3HQ). These are the nitrogen analogues of flavonols, for which the fluorescence properties of only two simple representatives have been published [1]. In this work, we have synthesized and studied the fluorescent properties of a series of 3HQ **4 a-g**.



R1 = H, Me; R2 = H, F, Cl, Me, OMe, OH.

It was indicated that all of 3HQs display ESIPT and thus have two bands in the fluorescence emission spectrum. Their emission changes dramatically upon the changes of the dye structure or of the nature of the environment. In comparison with flavonols, the 3HQs have additional possibilities for the improvement of fluorescent properties.

Kaynak

1. Feng Gao et al., J. Chem. Soc., Perkin Trans. 2 (1996) 269.