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BOOK OF ABSTRACTS



JAHORINA
MARCH 20-23, 2023

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BOSNIA AND HERZEGOVINA

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SYNTHESIS, STRUCTURE CHARACTERIZATION AND SOLVATOCHROMISM OF SOME ARYL AZO PYRIDONE DYES

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Abstract

Aryl azo pyridone dyes belong to a very important class of organic compounds. World annual production of synthetic dyes is over 60 % based on the azo derivatives. They are mostly used as coloring agents for textiles, paper, leather, rubber, polymer, and many other materials. With the development of high technology, these structures also found their application as components of lasers and nonlinear optical systems, LCD (liquid crystal display) screens, and thermal printers. Lately, increasing attention has been directed to the biological activity of azo compounds. It has been proven that they have anti-tumor, anti-inflammatory, anti-oxidant, anti-microbial, and anti-tuberculosis activity, while certain derivatives are used for therapeutic purposes. Aryl azo dyes are widely used due to their excellent physicochemical properties (primarily high value of the molar extinction coefficient and great resistance to light and wet processing) and the fact that can be obtained in a simple method of diazotization and coupling. In this paper, three new dyes of 6-hydroxy-5-(hydroxy substituted phenylazo)-4-methyl-2-oxo-1,2-dihydropyridine-3-carbonitriles were synthesized by a diazo coupling reaction starting from aminophenols (2-, 3- and 4-substituted) and 6-hydroxy-4-methyl-2-oxo-1,2-dihydropyridine-3-carbonitrile as coupling components. The obtained dyes were characterized by melting point, IR, NMR, and UV-Vis spectroscopy. Given the fact that the structure of the molecule and interactions obtained with the surrounding medium can affect its activity, the possibility of azo hydrazone tautomerism has been studied, as the influence of the position of the substituent present (orto-, meta- and para position). In addition, the effect of the solvent used was determined by applying a solvatochromic model using the LSER method (linear solvation energy relationship). Obtaining information about the inter- and intramolecular relationships that newly synthesized compounds can achieve may be of great importance for all further investigations and their potential application as biologically active compounds.

Key words: Aryl azo pyridone dyes, carbonitrile, synthesis, azo-hydrazone tautomerism, solvatochromism, intermolecular interactions

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