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Synthesis of some novel heterocyclic azo dyes for acridine derivatives and evaluation of their antibacterial activities

Nezar L. Shihab and Intedhar K. M.

Department of Chemistry, Basrah University, Basrah, Iraq

ABSTRACT

Five new azo dyes for acridine derivatives were synthesized using different approaches depending on the position of functional groups. The synthesis started with a commercially available unsubstituted acridine that was converted by nitration and amination to compounds that was useful building block in supramolecular chemistry by diazotization of 4(2,4-dichloro-δ-triazin)aniline DCTA . the structures of newly synthesized compounds were characterized by NMR, Mass, FT-IR spectra data and elemental analysis. All the synthesized compounds were screened for their antibacterial activities.

Keywords: acridine, azodyes, antibacterial activity.

INTRODUCTION

The development of natural and synthetic fiber production requires the study and implementation of new type of dyes with improved properties and superior results in term of yield. For many years, the azo comounds have been the main class of dyes used in various applications such as textile fibers dyeing, colouring of different materials and advanced organic synthesis. The synthesis and dyeing properties of azo compounds are described in many papers [1-6]. They are synthetic compounds and account for more than 50% of all the dyes produced annually, showing largest spectrum of colors [6-9]. Nearly all the dyestuffs used by the textile industry are azo dyes, and they are also widely used in printing, food, paper making and cosmetic industries. The more industrialized the society, the greater the use of azo dyes, and hence the greater the risk of their toxic effects affecting the society. It has already been noted that [10-11]. Bae and Freeman (2007) already demonstrated the biological toxicity of the the direct azo dyes used in the textile industry[8]. Various azo dyes have been shown the produce positive toxic results for different parameters [12].

Azo dyes are usually designed to resist biodegradation under aerobic conditions, the recalcitrance of these compounds being attributed to the presence of sulfonate groups and azo bonds [13], hence the development of non genotoxic dyes and investment in research to find effective treatments for effluents and drinking water is required, in order to avoid environmental and human exposure to these compounds and prevent the deleterious effects they can have on human and aquatic organisms [14]. In this work we tried the construction of supramolecular architectures with favorable properties and fascinating structures has drawn great attention. On the other hand, the early discovery of the biological effect of the acridine derivatives encouraged us to continue our interest in studying the spectral behavior of azo compounds for acridine.