AMERICAN JOURNAL OF PHARMTECH RESEARCH

Journal home page: http://www.ajptr.com/

Experimental Study of the Interaction of Coumarin-1 With an Aliphatic Amine

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ABSTRACT

Effect of aliphatic, Triethyl amine (TEA), and its concentration on fluorescence intensity of coumarin-1, one of the coumarin derivatives was investigated. Spectral investigation of coumarin-1 solution containing compounds showed change in intensity as compared to pure coumrin-1 solution. The variation of fluorescence intensity could be used for determination of aliphatic in quenching region. The average lifetime has been calculated and reported.

Keywords: Coumarin-1, Triethyl amine, lifetime.

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Received 06 November 2016, Accepted 08 December 2016

Please cite this article as: Bakkialakshmi S *et al*., Experimental Study of the Interaction of Coumarin-1 With an Aliphatic Amine. American Journal of PharmTech Research 2016.

INTRODUCTION

Coumarines are compounds originating from the nature that can be used in industry they are broadly used in cosmetics, in food, and drinks as a flavouring. They occur in ethereal oils of many plants, e.g., Cinnamon, (Cinnanonum zeylanicun). Coumarins owe their class name to coumarou the vernacular name of thetonka been (Dipteryxodorata), from which coumarin itself, was isolated in 1820[1].

The numorous coumarin heterodimers were synthesized and explored the possibility of their applications as larger dyes [2] as organic scientillators [3] and as triplet sentizers [4,5]. In a series of works effects of solvents, substituents, and temperatures on the various photophysical properties of coumarin compounds were reported [6-9].

MATERIALS AND METHOD

Coumarin-1 and TEA were purchased from Sigma Aldrich Company, Bangalore, and were used without further purification.

UV/Vis absorption spectra were taken using 1650 PC SHIMADZU UV-Visible SPECTROMETER Fluorescence measurements were made by Carry Eclipse Varian Fluorescence Spectro Photometer.

RESULTS AND DISCUSSION

Pico and nano second resolved photo are important spectroscopic techniques for characterizing quenching processes that are associated with the generation and the fate of photo excited state. The fine resolved spectra reveal as to how the acceptor is distributed in space around the donors [10]. In addition to this, they give information on the quenching process, specifying whether it is due to diffusion or complex formation.

The lifetime spectra of Cou-1 without and with TEA are shown in Fig.1. and the compiled data have been presented in Table 1. The occurrence of the shorter fluorescence decay times may be due to the distance between the pair [11].

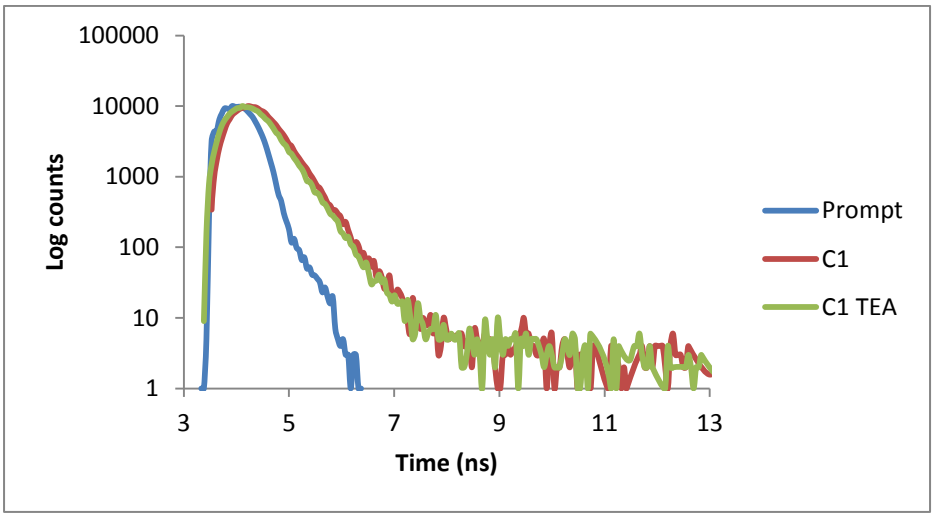

Figure 1: Fluorescence decay curves of Coumarin1 with and without TEA

The increase in lifetime indicates that the complexes may form in the solution such change in the lifetime occurs because quenching is an additional rate process that depopulates the excited state.

In the present investigation the lifetime of Cou-1 in both conditions [(i) Cou-1 & (ii) Cou-1 + TEA], hence the merging of the kinetic traces is not observed (The plots not look like a single decay curve). This shows that the quenching of Cou-1 might be dynamic in nature.

CONCLUSION

Experimental study of the interaction of coumarin-1 with an aliphatic , Tiethyl (TEA), has been carried out successfully. Lifetime spectra of coumarin-1 without and with triethyl amine have been recorded. The average lifetime has been calculated and tabulated.

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