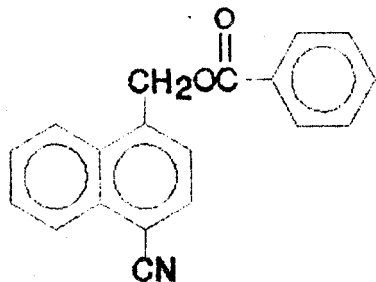


E2-38: Intramolecular electron transfer of 1-cyano naphthylmethyl benzoate, in aqueous β -cyclodextrine

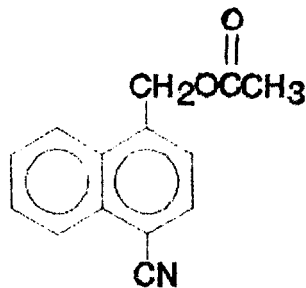
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Cyclodextrine formed by 6, 7 or 8 (α , β or γ) units are able to form inclusion complexes with a great variety of compounds. This property of cyclodextrine is responsible for the changes in the reactivity and selectivity of organic reactions as well as changes in eximer emission with naphthalene or pyrene both intramolecular and intermolecular. The intramolecular electron transfer of 4-cyano naphthylmethyl benzoate, 1 in β - cyclodextrine is reported.



1



2

The lower fluorescence quantum yield of 1 compared to 2 in methanol has been reported. This was explained by the intramolecular electron transfer from the naphthalene chromophore to the benzoate in 1. The measured fluorescence quantum yield of 1 in aqueous β -cyclodextrine increased with the concentration of β -cyclodextrine and became equal to the fluorescence quantum yield of 2 at 0.01 M β -cyclodextrine concentration as shown in Fig. 1. The isoemissive point of the emission spectra of 1 in β -cyclodextrine proved that a 1:1 complex was formed. The association constant of this complex was found to be $455 \text{ dm}^3 \text{ mol}^{-1}$ at room temperature.

The increase of fluorescence quantum yield of 1 with the β -cyclodextrine concentration can be attributed to the lowering of electron transfer rates. This is supported by the linear variation of logarithm of electron transfer quantum yield with logarithm of β -cyclodextrine concentration as given in the Fig. 2.

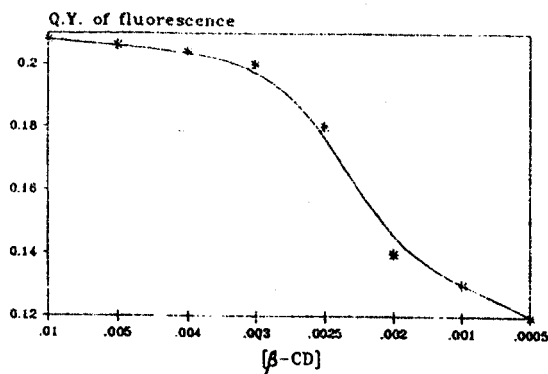


Figure 1: Variation of fluorescence quantum yield of 1 with [β -CD]

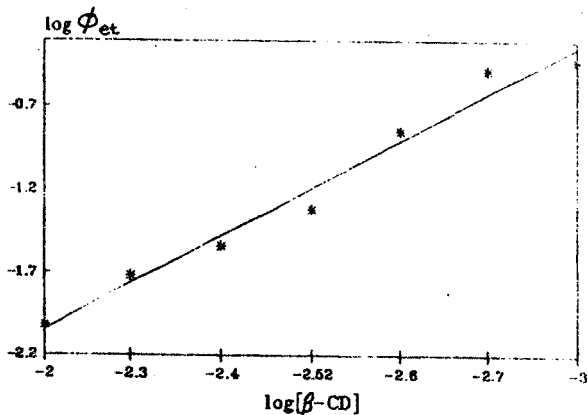


Figure 2: Variation of $\log \phi_{et}$ with $\log [\beta\text{-CD}]$