E2-32: Photoinduced intramolecular electron transfer of 9-anthracenemethyl esters in aqueous ß-cyclodextrin

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ß-Cyclodextrin is able to form inclusion complexes with a variety of compounds. The formation of such complexes change the excimer emission in bichromophoretic compounds. Recently the enhanced fluorescence of naphthylmethyl benzoate esters in aqueous ß-cyclodextrin was reported. In this paper, the intramolecular electron transfer of 9-anthracenemethyl acetate, (**I**) and 4'- nitrobenzoate, (**II**), in aqueous ß-cyclodextrin, are reported.

The ester **I** and **II** were prepared by mixing anthracene methanol and the corresponding acid chloride in benzene in the presence of pyridine. These esters were purified by chromatography on silica gel followed by recrystallization from CH_2Cl_2/hexane. The fluorescence quantum yields were measured in methanol. All the samples were degassed before the spectroscopic measurements.

The measured fluorescence quantum yield of II in aqueous ß- cyclodextrin is higher than that in methanol. However, the fluorescence quantum yield of **I** is the same in both methanol and ß-cyclodextrin. The data are given in *Table 1*.

Table 1: Corrected fluorescence quantum yields of I and II.

Compound	methanol	0.01M ß-cyclodextrin
1	0.300	0.300
2	0.028	0.072

The lower fluorescence quantum yield of **II** in methanol compared to that of **I** in methanol can be explained by the electron transfer from anthracene chromophore to the benzoate chromophore. The increased fluorescence quantum yield of **II** in 0.01M ß-cyclodextrin compared to that of **II** in methanol can be attributed to the lowering of electron transfer rates in 0.01M ß-cyclodextrin. Here the benzoate chromophore could be trapped in the inside of the cavity of ß-cyclodextrin and lowers the electron transfer rates. In the absence of benzoate chromophore in **I** it does not alter the fluorescence quantum yield.