

**PHOTOCHEMISTRY OF SUBSTITUTED  
BENZOATE ESTERS OF  
9- ANTHRACENEMETHANOL IN METHANOL  
AND MICELLAR SOLUTIONS**

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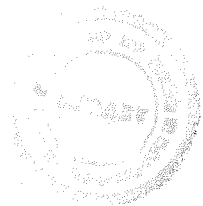
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## ABSTRACT

Fluorescence quenching in bichromophoric molecules by intramolecular electron transfer have been studied. The bichromophoric molecules selected for this investigation were substituted benzoate esters of 9-Anthracenemethanol. The synthesis and characterization of 11 substituted benzoate esters of 9-Anthracenemethanol were done. Absorption and emission properties of these esters in organic solvents and in micellar media such as SDS and TX-100 were recorded. The fluorescence quantum yield variation of substituted benzoate esters were explained by an intramolecular charge transfer mechanism. It has been deduced that this internal electron transfer takes place from excited Anthracene chromophore to benzoate chromophore.

Fluorescence measurements of this systems were taken with respect to 9-Anthracenemethyl acetate ester, which does not have electron transfer. Possible overlap of orbitals of donor, acceptor pair has been identified as the key to electron transfer.

Effect of substituents in the benzoate chromophore for the quenching of the fluorescence were examined. Esters having electron withdrawing substituents in the benzoate chromophore have more efficient intramolecular electron transfer and the esters having electron donating substituents in the benzoate chromophore have less efficient electron transfer. This was due to the change of the reduction potentials of the benzoate chromophore, by the substituents. For an efficient electron transfer process the oxidation potential of donor should be reduced whereas the reduction potential of the acceptor should be increased.



Electron withdrawing groups are pulling electrons from the benzoate chromophore resulting in a higher reduction potential i.e. efficient quenching of fluorescence. Electron donating groups lower the reduction potential of the benzoate chromophore by donating electrons to it. So quenching of fluorescence decreases compared to that of unsubstituted benzoate ester.

According to the data which have been obtained, the quantum yield of fluorescence is higher in micellar media than that in organic solvents. In SDS micelles electron transfer between two chromophores was possible. Fluorescence in SDS is enhanced compared to that in methanol. It was found that the electron transfer is restricted in TX-100 micelles compared to that in SDS. This change can be due to the shape of the micelle constituent in cell concentration and the difference of the micropolarity and the microviscosity of the micellar interior.