E2-03 : PHOTOLYSIS OF 9-FLUORINYL PHENYLACETATE : A NOVEL PHOTOREMOVABLE PROTECTING GROUP FOR CARBOXYLIC ACIDS

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The ester (1) on direct irradiation in methanol gave an ether (2), acid (3) and hydrocarbon (4) as major products. These products were identified by ^1H nmr and quantitative analyses were done by calibrated HPLC. The singlet state energy of the ester was estimated as 94 k cal mol^{-1} from the crossing point of excitation and emission spectrum. The reactive state of the ester was established as the singlet. According to previous work on 1-napthylmethyl phenylacetate esters[1], the products (2) and (3) are formed by the trapping of 9-fluorinyl carbocation and phenylacetate ions by the solvent methanol. Hydrocarbon (4) is formed by homolytic cleavage of the C-O bond followed by expulsion of CO_2 and coupling of the two radicals, since, this photochemical reaction gives a considerable yield of the free acid, the 9-fluorinyl group can be developed as a photoremovable protecting group for carboxylic acids.