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The First Successful Substitution of 5H-Dibenzo[a,d]cyclohepten-5-one

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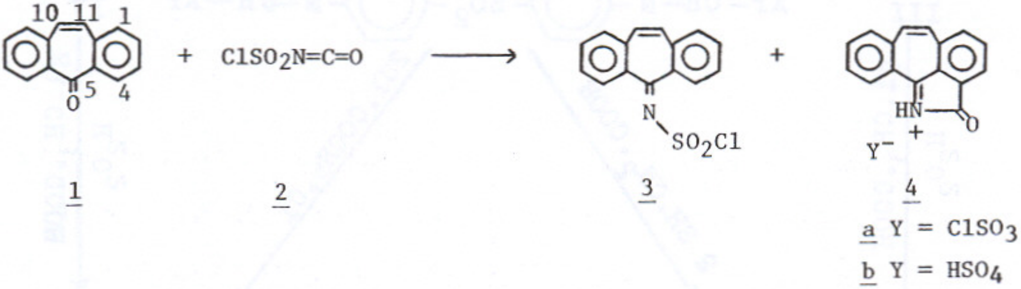
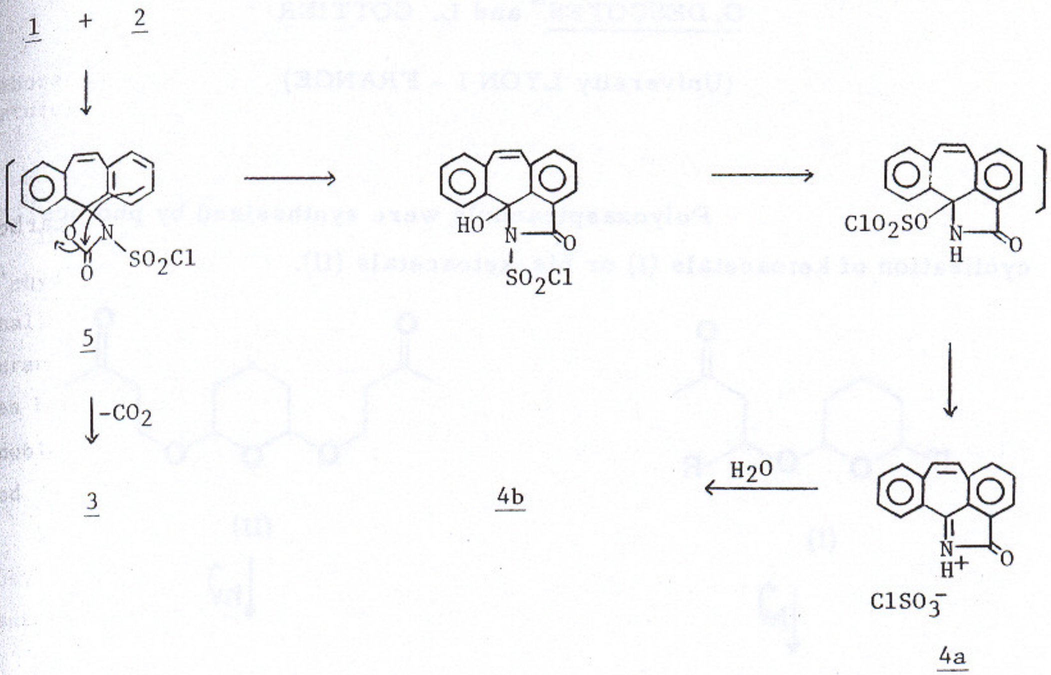
The reaction of 1 and chlorosulfonyl isocyanate 2 in refluxing benzene affords along with 3 (51% yield), the structure normally expected from the reaction of 2 with ketones, a new compound in 48% yield to which we have ascribed the structure 4a. Compound 4a is very unstable, fumes copiously when exposed to air, liberating HCl to yield 4b.

Scheme 1



The formation of 4 is best explained from the reactive intermediate 5 as shown in Scheme 2. Such intermediates are normally postulated for the formation of chlorosulfonylimines from aldehydes or ketones. In the case in hand, the nucleophilic attack of the adjacent ring probably competes with the loss of CO_2.

Scheme 2



Simple modifications of 4 provide an easy method for the introduction of various functionalities in the 4-position of 5-oxodibenzo[a,d]cycloheptene 1. Such compounds are largely unknown and their synthesis can only be achieved at present by total synthesis.