Dibenzo[*b*,*f*]azepin-2-one

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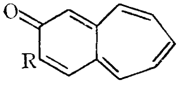
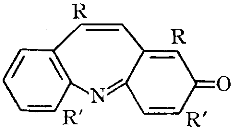
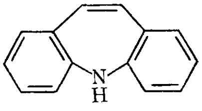
THE only known heterocyclic derivatives of the novel system (I; R = H, OH, and OMe)[1,2] are the compounds (II; R = H and Ac):[3] we have now prepared the parent, dibenzo[*b*,*f*]azepin-2-one (III). When iminostilbene† (IV) was treated with Fremy's salt[4] in acetone buffered with disodium hydrogen phosphate, two products‡ were obtained and separated by chromatography from unchanged starting material (5%).



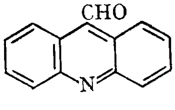
(I)



(II) R'=OH (III) R=R'=H

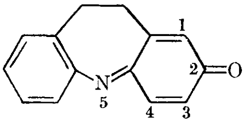


(IV)

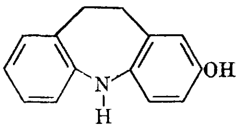


(V)

The first product $C_{14}H_9NO$ (37%) was yellow: we regard this as acridine-9-carbaldehyde (V) from the following data: m.p. 141—142° (lit.,[5] 139—140°), 2,4-dinitrophenylhydrazone, m.p. 232—235° (lit.,[6] 235°); the n.m.r. spectrum showed a signal at τ −1·4 which was not affected by addition of D_2O, ν_{max} (CCl_4) 5·9 μ and the mass spectrum contained a strong *M* − CO peak. The sequence from (IV) to the aldehyde (V) is formally similar to a ring contraction which *N*-acetyliminostibene is reported to undergo under acidic conditions, but we cannot suggest a simple mechanism to explain it.



(VI)



(VII)

The second product (53%) from the Fremy's salt reaction was a deep red crystalline material ($C_{14}H_9NO$), m.p. 135—136°: to this we allocate structure (III) on the following grounds. The n.m.r. spectrum consisted only of a series of multiplets between τ 1·8 and 3·6, in the mass spectrum the base peak was the *M* − CO ion[2] (its stability may be connected with the derived aza-azulene structure), the i.r. spectrum (Nujol) contained 3 strong bands at 6·1, 6·3, and 6·46 μ [the imino-ketone[7,8] (VI) has bands at 6·05, 6·14, and 6·33 μ], and catalytic hydrogenation of (III) yielded a substance (VII) identical to that obtained from the imino-ketone (VI).[7]

The stability of (III) is a little surprising since the unsubstituted bicyclic analogue (I; R = H) could not be isolated without decomposition[1] and carbotricyclic analogues of (III) have so far

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‡ Satisfactory analytical and spectral data were obtained for all new compounds.

proved elusive.[9] Our data are too meagre to allow comment on the aromaticity of the system (III).

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