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A NEW RING SYSTEM FROM 1,8-DISTYRYLNAPHTHALENE

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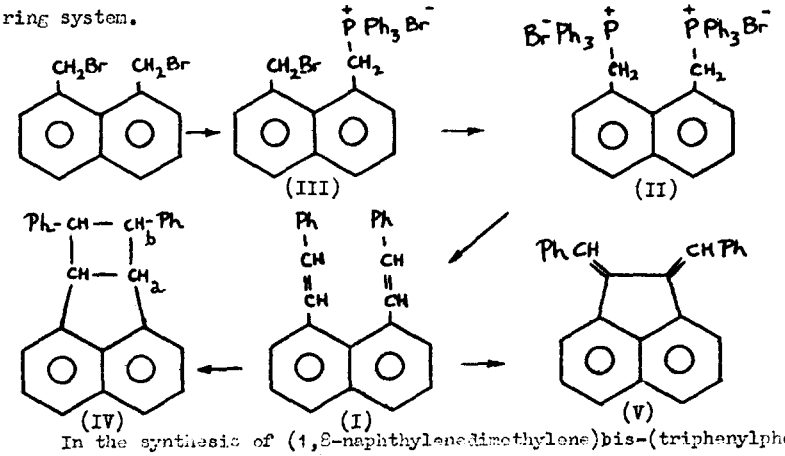
We have prepared 1,8-distyrylnaphthalene (I) by a similar method to Bergmann and Agranant[1] and have subsequently photolysed and dehydrogenated (I) to the acenaphthene derivatives (IV) and (V) respectively; (IV) represents a new ring system.



In the synthesis of (1,8-naphthylenedimethylene)bis-(triphenylphosphonium bromide)(II) we first prepared the monophosphonium bromide (III) by dissolving equimolar amounts of 1,8-naphthalenedimethylbromide[2] and triphenylphosphine in benzene, and leaving for 24 hours; 1-(8-bromomethyl)naphthylmethytriphenylphosphonium bromide precipitated in 90% yield: m.p.195°. Calculated (for $C_{30}H_{22}Br_2P$), Br 27.8%; found Br 27.0%. Equimolar amounts of (III) and triphenylphosphine were dissolved in dimethylformamide and left for 24 hours; the known diphosphonium salt (II) precipitated out of solution.

Treatment of (II) with benzaldehyde in sodium ethoxide, gave 1,8-distyrylnaphthalene: m.p. (from ethanol) 135°; yield 50%. $\lambda_{max.}^{EtOH}$ 340 mμ (log ε = 4.30), 258 mμ (4.46); τ 2.0-3.2; ν^{KBr} 960, 745, 690 cm^{-1}. Fluorescence spectrum: 427 mμ (broad band). The physical properties of (I) are not exactly in concordance with those described by Bergmann and Agranant. We were unable to obtain a m.p. above 135°.

Irradiation of (I) in boiling cyclohexane with 2537 Å light gave cubes of acenaphthene [1,2-a] 3,4-diphenylcyclobutene (IV): m.p. (from ethyl acetate) 335°; yield 90%. Calculated for $C_{26}H_{20}$, C 94.0, H 6.0%; found, C 93.6, H 5.8%. τ_{ar} 2.0-2.9, τ_{CH_a} 4.0, τ_{CH_b} 5.2(J_{ab} 5 cps.). $\lambda_{max.}^{EtOH}$ 300 mμ, 225 mμ (log ε = 4.9).

Sublimation of (I) from 5% palladium on charcoal over N_2 at 300° gave a red compound, m.p. 130° (ethanol, 20% yield) confirmed to be 1,2 dibenzylidenacenaphthene[3](V) having ultraviolet and infrared spectra identical with an authentic sample.

References

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2. E.D. Bergmann and T. Samuskkovitz, J.Amer.Chem.Soc., 1953, 75, 2760

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