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POSSIBLE FORMATION OF TETRAPHENYLCYCLOBUTADIENE

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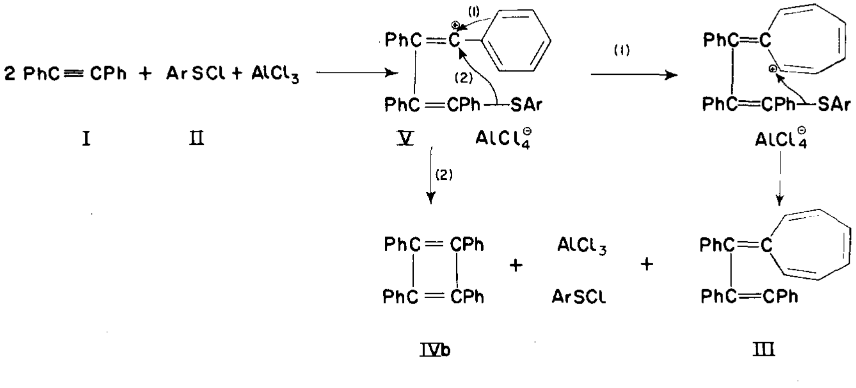
FROM the reaction between diphenylacetylene I and 2:4-dinitrobenzenesulphenyl chloride II in the presence of aluminium chloride, Assony and Kharasch isolated[1] besides the 1:1 adduct, two products with the formula $C_{28}H_{20}$: the first III was identified as 1:2:3-triphenylazulene; the second IVa, a non-identified colourless hydrocarbon melting at 154-155° formed in minute amounts, was not identical with 1:2:3-triphenylnaphthalene.

The consideration of a possible mechanism for this reaction involving



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[1] S. J. Assony and N. Kharasch, J. Amer. Chem. Soc. 80, 5979 (1958).

the intermediate formation of the cation V, suggested the possibility of the colourless hydrocarbon IVa being tetraphenylcyclobutadiene IVb.

Taking into account that, as shown by Prof. C.D. Nenitzescu and collaborators in this laboratory, cyclobutadiene may be isolated as its mercury or silver nitrate complex,[2] having in gaseous state a half-life of about 1 min,[3] and that tetramethylcyclobutadiene dimerises to a unitary product,[4] it would not be surprising to find that tetraphenylcyclobutadiene is a stable compound.[5]

In view of the great theoretical importance of the cyclobutadiene problem, it would be highly interesting to test the postulated identity IVa≡IVb; the simplest method seems to be the equivalence of all four phenyl groups as shown by the nuclear (proton) magnetic resonance spectrum.[6]

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[2] M. Avram, E. Marica and C. D. Nenitzescu, Chem. Ber. **92**, In press (1959).

[3] C. D. Nenitzescu, Personal communication.

[4] R. Criegee and G. Louis, Chem. Ber. **90**, 417 (1957).

[5] R. Breslow and M. Battiste, Chem. & Ind. 1143 (1958).

[6] R. Breslow and C. Yuan, J. Amer. Chem. Soc. **80**, 5991 (1958).