some hyperfine splitting by the phenyl hydrogens may be uncovered with further resolution.[14] In support of this, possible side band structure was noted in the spectrum of I from the present work. Further investigation of this point is planned.

Helpful discussions with Dr. W. M. Jones and Dr. W. S. Brey, Jr., of this department, are gratefully acknowledged.

[14] Reitz recently has resolved the e.s.r. spectrum of pentaphenylcyclopentadienyl into at least 33 lines separated by 0.3 gauss. The pattern observed is that expected for the ratios of spin densities in an odd-alternant radical such as the triphenylmethyl radical, but the magnitude of the splitting is best accounted for by twisted phenyl rings [D. C. Reitz, *J. Chem. Phys.*, **34**, 701 (1961)].

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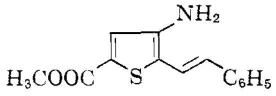
RECEIVED AUGUST 3, 1962

A DERIVATIVE OF BORAZARENE[1]

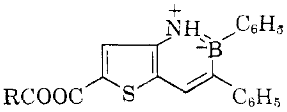
Sir:

We wish to report the first synthesis of a derivative of borazarene.[2] Reduction of methyl 2-styryl-3-nitrothiophene-5-carboxylate[3] with tin and hydrochloric acid gave methyl 2-styryl-3-aminothiophene-5-carboxylate (I), isolated as its acetyl derivative, m.p. 203–203.5°. *Anal.* Calcd. for $C_{16}H_{15}NO_3S$: C, 63.8; H, 4.98; N, 4.65. Found: C, 63.7; H, 4.9; N, 4.75. Condensation of (I) with phenyl dichlorobornite gave 2-carbomethoxy-5,6-diphenyl-5,4-borazarobenzothiophene (IIa). The product crystallized as pale yellow needles from a solution of benzene and methylene chloride, m.p. 200–201°, $\lambda_{\max}^{\mathrm{EtOH}}$ 222 mμ (ε 20,100), 240 mμ (ε 17,1780), 286 mμ (ε 14,930), 310 mμ (ε 10,310), 355 mμ (ε 25,500). *Anal.* Calcd. for $C_{20}H_{16}NO_2BS$: C, 69.6; H, 4.69; N, 4.1. Found: C, 69.7; H, 4.69; N, 4.2.

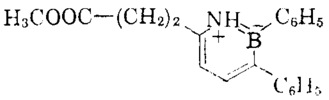
This is the first sulfur-containing heteroaromatic boron compound of this type to be reported. Hydrolysis of (IIa) with methanolic sodium hydroxide gave the corresponding acid (IIb), m.p. 205°. *Anal.* Calcd. for $C_{19}H_{14}NO_2BS$: C, 68.9; H, 4.23; N, 4.23. Found: C, 68.9; H, 4.15; N, 4.15.



I



IIa, R = CH3
b, R = H



III

Attempts to desulfurize (II) with freshly prepared active Raney nickel[4] by the method of Blicke and Sheets[5] failed to give any new compound; however, reactions of (II) with samples of Raney nickel that had been prepared some months earlier gave excellent yields (80–85%) of 2,3-diphenyl-6-(2-carbomethoxy-ethyl)-2,1-borazarene (III), m.p. 110–110.5°, $\lambda_{\max}^{\mathrm{EtOH}}$ 220 mμ (ε 18,450), 275 mμ (ε 10,970), 306 mμ (ε 15,850). *Anal.* Calcd. for $C_{20}H_{20}NO_2B$: C, 75.7; H, 6.39; N, 4.42. Found: C, 75.52; H, 6.39; N, 4.55. No change was observed in the ultraviolet spectrum of (III) in absolute ethanol in the presence of acid or alkali over a period of a week. The latter evidence, and the fact that the double bonds in the borazarene ring remained intact during the desulfurization of (II), indicate that (III) is an aromatic compound of considerable stability.

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(1) This work has been supported by the Atomic Energy Commission under Contract No. A.E.C. 889.

(2) M. J. S. Dewar and R. Dietz, *J. Chem. Soc.*, 2728 (1959), suggested that borazarobenzene should be given the trivial name borazarene. Since 2,1-borazarobenzene is expected on theoretical grounds to be much more stable than the 3,1- or 4,1-isomers, we suggest that the name "borazarene" apply only to the 2,1-isomer. The other isomers could be called β-borazarene and γ-borazarene (*cf.* tropolone, β-tropolone and γ-tropolone).

(3) I. J. Rinkes, *Rec. Trav. Chim.*, [4] **52**, 538 (1933).

(4) R. Mozingo, D. E. Wolfe, S. A. Harris and K. Folkers, *J. Am. Chem. Soc.*, **65**, 1013 (1943).

(5) F. F. Blicke and D. G. Sheets, *ibid.*, **71**, 4010 (1949).

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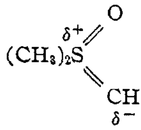
RECEIVED JULY 27, 1962

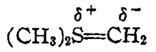
DIMETHYLSULFONIUM METHYLIDE, A REAGENT FOR SELECTIVE OXIRANE SYNTHESIS FROM ALDEHYDES AND KETONES

Sir:

As a result of the general synthetic utility of dimethyloxosulfonium methylide (alternatively dimethylsulfoxonium methylide) (I) as a reagent for the addition of methylene to double bonds which are receptive to nucleophiles,[1] a study of the related dimethylsulfonium methylide (II) seemed appropriate despite indications that sulfonium ylides derived from non-stabilized carbanions are subject to rapid spontaneous decomposition[2] while those in a highly stabilized condition, *e.g.*, 9-fluorenyl derivatives,[3] are of very limited synthetic import. This report summarizes the first returns of such an investigation including a practical method for the generation of the ylide II in a reasonably stable condition and the application of this substance as a reactive but *exceedingly selective* methylene transfer agent.



I



$$(CH_3)_2\overset{\delta+}{S}{=\!=}\overset{\delta-}{CH_2}$$

II

Solutions of dimethylsulfonium methylide were prepared successfully by addition of a solution of trimethylsulfonium iodide with stirring to a solution of methylsulfinylcarbanion[4] in equivalent amount under nitrogen, as was the case with the oxosulfonium ylide I[1] except that it was necessary to conduct the reaction at lower temperatures (0 to −10° in dimethyl sulfoxide containing enough tetrahydrofuran to prevent freezing) be-

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(1) E. J. Corey and M. Chaykovsky, *J. Am. Chem. Soc.*, **84**, 867 (1962).

(2) *Cf.* V. Franzen, H.-J. Schmidt and C. Mertz, *Ber.*, **94**, 2942 (1961).

(3) A. W. Johnson and R. B. LaCount, *J. Am. Chem. Soc.*, **83**, 417 (1961).

(4) E. J. Corey and M. Chaykovsky, *ibid.*, **84**, 866 (1962).