

Gallium reduction was examined in 0.1 *M* sodium salicylate (pH 4) in the presence and absence of 1 *M* KSCN in view of reports^{3a,d,e} asserting that the gallium d.c. step is more clearly defined in such media. Admittance curves nearly identical as to position and morphology were obtained for these separate solutions, each giving evidence of two close-lying peaks, which were then made more clearly distinguishable by phase elimination of the 4.5- μ a. background current; one such curve is shown as Figure 1B. The current minimum at -0.97 v. vs. s.c.e. coincides closely (considering possible differences in junction potential) with the d.c. half-step value of -0.988 v. reported previously.¹⁰ Though a possible stepwise reduction of Ga(III) is not excluded, it would seem more reasonable at this juncture to suspect that the peaks, located at -0.95 and -1.01 v. vs. s.c.e., correspond to the reduction of two different Ga(III)-salicylate complex ions. This point is being pursued.

(10) E. Vinogradova and N. Chudinova, *Zavodsk. Lab.*, **22**, 1280 (1956); *Chem. Abstr.*, **51**, 11131b (1957).

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Monocarbaheptaborane(7)¹

Sir:

Over the past several years the discovery and characterization of a considerable number of two-carbon carboranes have been reported.² In the course of investigating the products of an electric discharge of 1-methylpentaborane we have isolated a material, CB₅H₇, which represents the first known one-carbon carborane.

Using a silent electric discharge apparatus and techniques previously described,^{2a,3} 0.15 mole of 1-methylpentaborane yields 13 mg. of a homogeneous compound: R_v (g.l.c.) = 0.65 (relative to B₅H₉, R_v = 1.00); vapor tension, 503 mm. at 26°; mol. wt. (gas density), 74.4, calcd. 73.0. The ¹¹B n.m.r. of the pure compound displays three sets of doublets ($\delta^4 + 19.1$, $J = 184$ c.p.s.; $\delta + 9.7$; $J = 162$ c.p.s.; $\delta - 2.5$, $J = 174$ c.p.s.) with an area ratio of 2:2:1, respectively, which together with the molecular weight data clearly indicates the presence of five borons. Additionally, the coupling constants for the observed doublets signify the attachment of one terminal hydrogen to each

(1) Based on nomenclature rules adopted for carboranes: R. Adams, *Inorg. Chem.*, **2**, 1087 (1963); also, private communication.

(2) (a) R. E. Williams, C. D. Good, I. Shapiro, and B. Keilin, Abstracts, 140th National Meeting of the American Chemical Society, Chicago, Ill., Sept. 1961, p. 14N; *J. Am. Chem. Soc.*, **84**, 3837 (1962); *ibid.*, **85**, 3167 (1963); (b) T. Onak, R. E. Williams, and H. G. Weiss, *ibid.*, **84**, 2380 (1962); (c) T. Onak, F. J. Gerhart, and R. E. Williams, *ibid.*, **85**, 3378 (1963); (d) T. L. Heying, J. W. Ager, S. L. Clark, D. J. Mangold, H. L. Goldstein, M. Hillman, R. J. Polak, and J. W. Szymanski, *Inorg. Chem.*, **2**, 1089 (1963); (e) M. M. Fein, J. Bobinski, N. Mayes, N. Schwartz, and M. S. Cohen, *ibid.*, **2**, 1111 (1963); (f) L. I. Zakharin, V. E. Stanko, V. A. Bratzev, Yu. A. Chapovsky, and O. Yu. Okhlovystin, *Izv. Akad. Nauk SSSR, Otd. Khim. Nauk*, 2238 (1963); (g) D. Grafstein and J. Dvorak, *Inorg. Chem.*, **2**, 1128 (1963); (h) H. Schroeder and G. D. Vickers, *ibid.*, **2**, 1317 (1963); (i) S. Papetti and T. L. Heying, *J. Am. Chem. Soc.*, **86**, 2295 (1964); (j) F. Tebbe, P. M. Garrett, and M. F. Hawthorne, *ibid.*, **86**, 4222 (1964).

(3) T. Onak, R. P. Drake, and G. B. Dunks, *Inorg. Chem.*, **3**, 1686 (1964).

(4) Boron trifluoride was used for the external standard.

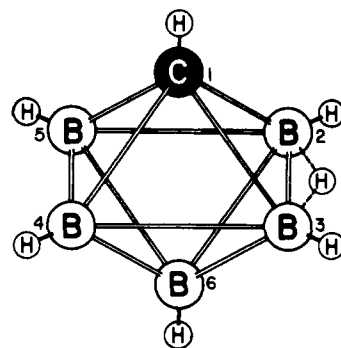


Figure 1. Proposed geometry of CB₅H₇. Lines drawn between central atoms (C, B) are not meant to indicate localized two-electron bonds.

boron. The infrared spectrum exhibits medium intensity C-H (2960 cm.⁻¹), strong B-H (2640 cm.⁻¹), and medium B-H_{bridge}-B symmetric (2167 cm.⁻¹) stretching frequencies. However, a maximum of one bridge hydrogen and one hydrogen bonded to carbon is evident from a ¹H n.m.r. area analysis.

The above evidence requires a molecular formula of CB₅H₇. This is substantiated by a sharp cutoff in the mass spectrum at m/e 74 which corresponds to the ¹²C¹¹B₅¹H₇⁺ ion.

On the basis of the proposed octahedral structure⁵ for the predicted CB₅H₆⁻, it is expected that the conjugate acid, CB₅H₇, would differ only by a bridge hydrogen linking two adjacent borons. Certainly such a structure is consistent with all available information. From ¹¹B n.m.r. the isomeric possibility depicted in Figure 1 is favored, although placement of the bridge hydrogen between borons 2 and 6 is not excluded if an accidental overlap of resonance lines occurred.

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(5) W. N. Lipscomb, "Boron Hydrides," W. A. Benjamin, Inc., New York, N. Y., 1963, p. 89.

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The Selective Photoreduction of Uridine in Polynucleotides

Sir:

Problems dealing with the structure and function of biopolymers require organic reagents and reactions that specifically attack or modify single components of the macromolecule. While selective modifications have been elaborated for proteins,¹ only a relatively small number of such reactions are known for polynucleotides. Compared with the variety of amino acids, the four major base units of DNA and RNA are chemically much less differentiated. This lack of differential reactivity and the restrictions to an aqueous

(1) Cf. B. Witkop, *Advan. Protein Chem.*, **16**, 221 (1961).