UNUSUAL REACTION OF DIETHYLAMINOMETHYL (METHYL) PHENYLPHOSPHINE

B. A. Arbuzov, O. A. Erastov, and G. N. Nikonov

UDC 542.91:547.1'118

The interaction of diethylaminomethyl(methyl)phenylphosphine (I) with the isobutyl ester of diphenylboronic acid in the presence of paraformaldehyde gave 2,2,5-triphenyl-5-methyl-2boronate-5-phosphonyl-1,3-dioxane (II) [1], which was the first example of the replacement of an aminomethyl group for hydroxymethyl in tertiary phosphines [2]. The formation of diethylmethylamine and isobutyraldehyde indicated the occurrence of a hydride transfer from the isobutoxy group to the aminomethyl group.



A mixture of (I) (11 g:0.05 mole), paraformaldehyde (3.2 g:0.1 mole), and diphenylboronic acid isobutyl ester (12.5 g:0.05 mole) was heated to about 150°C, after which the reaction went spontaneously with evolution of heat. Volatile components were collected in a trap cooled with liquid nitrogen. The residue was crystallized from CH₃CN. Yield of (II) was 12 g (70%), mp 151°C, δ ³¹P 1 ppm (CH₃CN) (see [1]). The liquid from the trap (6 ml) had absorption at 1720 cm^{-1} (C=O) in the IR spectrum (the presence of isobutyraldehyde was confirmed by GLC) and after treatment with EtI gave a solid which was filtered off and crystallized from acetone. The yield of methyltriethylammonium iodide was 4.4 g (35%), mp 306°C. It was obtained by an alternate synthesis from triethylamine and methyl iodide, mp 306°C. Found: C 34.77; H 7.48; N 6.01%. C7H1eNI. Calculated: C 34.57; H 7.41; N 5.76%. The IR spectra of the products were identical.

LITERATURE CITED

1. B. A. Arbuzov, O. A. Erastov, G. N. Nikonov, A. A. Espenbetov, A. I. Yanovskii, and Yu. T. Struchkov, Izv. Akad. Nauk SSSR, Ser. Khim., 1545 (1981). 2.

K. A. Petrov, V. A. Chauzov, and S. V. Agafonov, Usp. Khim., 60, 412 (1982).

A. E. Arbuzov Institute of Organic and Physical Chemistry, Kazan Branch, Academy of Sciences of the USSR. Translated from Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No. 8, p. 1926, August, 1983. Original article submitted February 9, 1983.

1749