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LETTERS TO THE EDITOR

New Route to Tetraarylarsenic Halides

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Several routes to tetraarylarsenic halides are known. Among them the most important are the reaction of triarylarsine with halobenzene in the presence of aluminum halide and the reaction of triarylarsine oxide with arylmagnesium halide followed by treatment of reaction mixture with aqueous solution of hydrogen halide [1]. Some of these compounds were also prepared from pentaarylarsenic and the corresponding acid [2].

We found a new route to tetraarylarsenic halides: reaction of pentaarylarsenic with triarylarsenic dihalides. It was developed for tetraphenylarsenic chloride and bromide **IIIa** and **IIIb** as examples; these compounds were prepared in 96% and 97% yield from pentaphenylarsenic **I** and triphenylarsenic dichloride **IIa** and dibromide **IIb**, respectively.

$$\underset{\mathbf{I}}{Ph_5As} + \underset{\mathbf{IIa},\ \mathbf{IIb}}{Ph_3AsHlg_2} \rightarrow \underset{\mathbf{IIIa},\ \mathbf{IIIb}}{2Ph_4AsHlg}$$

Hlg = Cl (**IIa**, **IIIa**), Br (**IIb**, **IIIb**).

Reactions were carried out by heating of the starting compounds in an aromatic hydrocarbon. They can also proceed at room temperature, but with a smaller rate.

Similar syntheses of antimony and bismuth derivatives of the general formula Ar_4EX (E = Sb, Bi) were reported previously [3–9]. Here we have shown that arylation of triarylhalides of Group V elements with their pentaaryl derivatives is also characteristic of the aryl derivatives of arsenic(V).

Tetraphenylarsenic chloride (IIIa). A mixture of 1.00 g of pentaphenylarsenic, 0.82 g of triphenylarsenic dichloride, and 15 ml of toluene was heated at 90°C for 1 h. After removing the solvent the residue was recrystallized from water. Tetraphenylarsenic chloride, 1.75 g (96%), was obtained, mp 256°C (published data: 255–257°C [1]). A mixture with an authentic sample of tetraphenylarsenic chloride melted without temperature depression.

Tetraphenylarsenic bromide (IIIb) was prepared similarly from pentaphenylarsenic and triphenylarsenic dibromide in a 97% yield; mp 273°C (published data: 273–275°C [1]).

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