The solid-phase anhydroheterocyclization of 2,2′-dihydroxy-3,3′,5,5′-tetra-*tert*-butylbiphenyl under the action of dioxane dibromide

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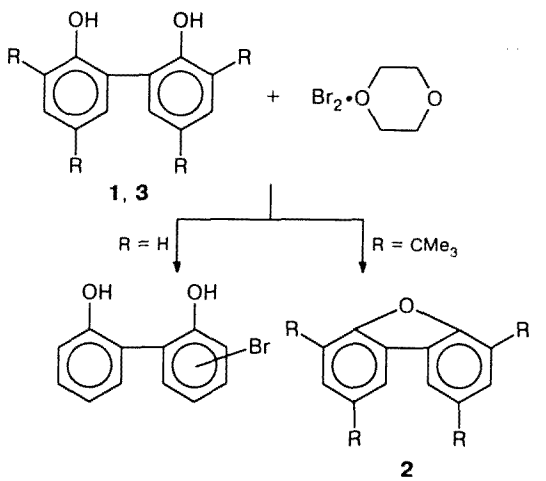
We have found that 2,2′-dihydroxy-3,3′,5,5′-tetra-*tert*-butylbiphenyl (**1**), when ground with dioxane dibromide (DDB) (0.2 to 1 mole of DDB per mole of compound **1**), was quantitatively converted into 2,4,6,8-tetra-*tert*-butyldibenzofuran (**2**) over a period of several minutes. The compound obtained requires no additional purification, since DDB and the water liberated are spontaneously removed; m.p. 208—209 °C (from MeOH) corresponds to the literature data.[1]

It is noteworthy that the mixture is not liquefied during the reaction. Thus, DDB acts as the catalyst of the solid-phase anhydroheterocyclization of compound **1**, the mechanism of the transformation of **1** into **2** (Scheme 1) being probably similar to the mechanism of the liquid-phase process considered in the previous communication.[2]

We also found that the extreme ease of the transformation observed is a specific property of compound **1**. Under identical conditions its nonsubstituted analog, 2,2′-dihydroxybiphenyl (**3**), is brominated with DDB, and no benzofuran is detected among the reaction products. It is natural to assume that the *tert*-butyl groups in compound **1** accomplish the double function of position protectors that protect the rings from halogenation and sterically protect the OH groups from participating in the formation of intermolecular hydrogen bonds, which would compete with the formation of intramolecular hydrogen bonds.

The reaction of compound **3** with DDB was monitored by TLC on Silufol UV_{254} plates. This process was found to yield a mixture of bromo-derivatives of **3**, the corresponding dibenzofuran being completely absent.

Scheme 1



R = CMe_3 (**1**), H (**3**)

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