



Hydrogenation of methyl 2,3-di-*O*-benzoyl-4,6-*O*-benzylidene- α -D-galactopyranoside⁶ with palladium black in alcohol at 65° gave a quantitative yield of analytically pure methyl 2,3-di-*O*-benzoyl- α -D-galactopyranoside as a glass. Found: C, 62.4; H, 5.60. Tosylation of the dibenzoate gave a 60% yield of crystalline methyl 2,3-di-*O*-benzoyl-4,6-di-*O*-(*p*-tolylsulfonyl)- α -D-galactopyranoside (I),⁷ m.p. 128–129°, $[\alpha]_D^{39} +150^\circ$ (1% in chloroform). Found: C, 58.8; H, 4.91; S, 9.11. Treatment of 0.5 g. of I with 0.7 g. of sodium benzoate in 15 ml. of *N,N*-dimethylformamide at 140° for 24 hours gave a 49% yield of II, m.p. 104°, $[\alpha]_D^{31} +78^\circ$ (0.5% in chloroform). Found: C, 68.9; H, 5.36. This product was identical with authentic methyl α -D-glucopyranoside tetrabenzoate, as shown by the infrared spectra and mixed melting point behavior. An interesting and important contrast is the reported failure⁸ of methyl 4-*O*-(*p*-tolylsulfonyl)- β -D-galactopyranoside, when treated with refluxing methanolic sodium methoxide, to give any evidence for a tosylate displacement.

This successful benzoate displacement lends further credence to the suggestion⁵ that sodium benzoate in *N,N*-dimethylformamide be placed high on the list of powerful nucleophilic reagents⁹

(6) M. Gyr and T. Reichstein, *Helv.*, **28**, 226 (1945).

(7) Examination of models suggested that the galactopyranoside conformation (I) in which the 4-*O*-tosyl is axial should be favored sterically, thus aiding the back-side attack on the 4-position by benzoate.

(8) A. Müller, M. Móricz, and G. Verner, *Ber.*, **72B**, 745 (1939).

(9) Since sodium acetate in acetic anhydride displaced only the primary 5-tosylate, but not the ring 3-tosylate of 1,2-*O*-isopropylidene-3,5-di-*O*-(*p*-tolylsulfonyl)-D-xylofuranose,¹⁰ it would be of interest to investigate whether or not both tosylates could be displaced by sodium benzoate in *N,N*-dimethylformamide.

(10) L. Vargha, *Chem. Ber.*, **87**, 1351 (1954).

and that the potential of this reagent be investigated further for the synthesis of rare sugars.

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Received September 2, 1959

A New Synthesis of Triptycene

Sir:

We wish to report the synthesis of triptycene¹ by a new, simple, and direct route. When the adduct (I) between anthracene and *p*-benzoquinone was reduced with LiAlH₄ or NaBH₄, a crude mixture resulted. Although this mixture was not separated and analyzed, its infrared spectrum and subsequent reactions were consistent with the assumption that it contained the diol reduction products. This mixture, when refluxed with ethanolic hydrochloric acid followed by chromatography of the products on acid alumina, gave triptycene in 15% yield based on I. This hydrocarbon had a m.p. 254–256 and an infrared tracing that was superimposable on that of authentic triptycene. *Anal.* Calcd. for C₂₀H₁₄: C, 94.45; H, 5.55. Found: C, 94.49; H, 5.78. In addition to the triptycene, a substance identified as anthracene was obtained in 25% yield based on I.

The present synthesis of triptycene is considerably shorter than the elegant classical synthesis by Bartlett, Ryan, and Cohen.¹ Further, it shows promise of being more generally applicable to the synthesis of bridgehead substituted triptycenes than the ingenuous syntheses through benzyne by Wittig and co-workers.^{2–4}

The details of the present route and its extension to substituted triptycenes are being investigated.

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Received September 15, 1959

(1) P. D. Bartlett, M. J. Ryan, and S. G. Cohen, *J. Am. Chem. Soc.*, **64**, 2649 (1942).

(2) G. Wittig and E. Benz, *Ber.*, **91**, 873 (1958).

(3) G. Wittig and R. Ludwig, *Angew. Chem.*, **68**, 40 (1956).

(4) G. Wittig and E. Benz, *Angew. Chem.*, **70**, 166 (1958).

(5) Taken from a dissertation submitted by A. C. Craig to Cornell University for the Ph.D. degree, June 1959.