SHORT COMMUNICATIONS

The Synthesis of 2′,3′,4,4′,6′-Pentahydroxychalcone[1]

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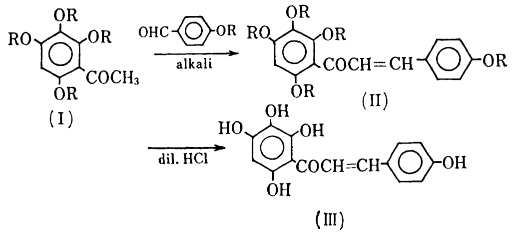
The structure of carthamin, the coloring matter of the flowers of *Carthamus tinctorius*, has been identified as a glucoside of 2′,3′,4,4′,6′-pentahydroxychalcone (III).[2,3]

The hydrolysis of carthamin gave the corresponding flavanones, *i. e.*, carthamidin and isocarthamidin. However, the aglycon (III) has not been isolated as a chalcone form because of its instability.[2] This uncertain behavior of III has prompted the present authors to attempt the synthesis of III according to the following scheme:



(R:CH_3OCH_2-)

The condensation of 2,3,4,6-tetrakis(methoxymethoxy)acetophenone (I), which had been prepared by the methoxymethylation of 2,3,4,6-tetrahydroxyacetophenone[4] with *p*-methoxymethoxybenzaldehyde, afforded 2′,3′,4,4′,6′-pentakis(methoxymethoxy)chalcone (II) as a pale yellow, viscous oil. The subsequent cautious hydrolysis of II with dilute hydrochloric acid in methanol gave III as yellow crystals; mp 180—182°C: UV; $\lambda_{\max}^{\mathrm{EtOH}}$ 375 mμ (log ε=4.47).

The structure of this compound was identified by elemental analysis, by a study of the IR spectrum, and, furthermore, by its conversion into 2′,3′,4,4′,6′-pentamethoxychalcone, mp 92—93°C, which was identified by a comparison of the melting point and the UV and IR spectra with those of an authentic sample.[6]

The overall yield of III from 2,3,4,6-tetrahydroxyacetophenone was 25%. The IR spectrum of the new chalcone (III) is shown in Fig. 1.

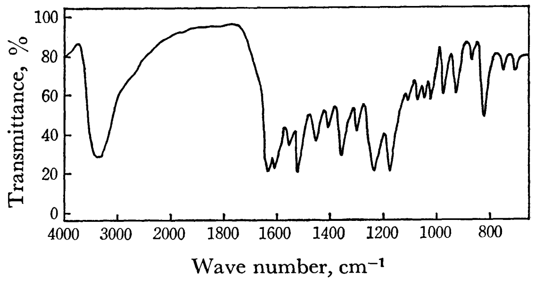


Fig. 1. The IR spectrum of 2′,3′,4,4′,6′-pentahydroxychalcone (III).

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[1] Presented at the 23rd Annual Meeting of the Chemical Society of Japan, Tokyo, April, 1970.

[2] C. Kuroda, *Nippon Kagaku Zasshi*, **51**, 237 (1930); *J. Chem. Soc.*, **1930**, 752.

[3] T. R. Seshadri and R. S. Thakur, *Curr. Sci.*, **29**, 54 (1960).

[4] This compound was prepared from 1,2,3,5-tetrahydroxybenzene by a Hoesch reaction, mp 236—238°C (lit,[5] mp 204—205°C); tetramethylether, mp 55—56°C (lit,[2] mp 53—54°C).

[5] M. Nierenstein, *J. Chem. Soc*, **1917**, 4.

[6] This sample was prepared by the condensation of 2,3,4,6-tetramethoxyacetophenone with *p*-methoxybenzaldehyde according to Kuroda's method,[2] and the structure was confirmed by elemental analysis and by a study of the IR and NMR spectra; mp 92—93°C (lit,[2] mp 112°C).