Potential Controlled Anodic Oxidation of 4-(3,4-Dimethoxybenzyl)-6,7-dimethoxyisochroman-3-one

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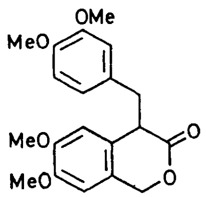
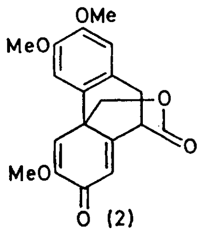
Summary Electrochemical oxidation of 4-(3,4-dimethoxybenzyl)-6,7-dimethoxyisochroman-3-one effects cyclization to a spiro-cyclohexadienone; evidence for the structure of the product is presented.

THERE is much interest in the mechanism and synthetic utility of the electro-oxidative cyclization of stilbene and dihydrostilbene derivatives[1] and the recent observation of the electrochemical cyclization of (±)-laudanosine[2] prompts us to report a similar ring-closure reaction of an isochroman-3-one derivative. As part of a study of the chemistry of this system, (**1**) was prepared and oxidized in acetonitrile solution containing sodium perchlorate and sodium carbonate at a platinum anode maintained at a potential of 1·2 V (*vs.* Ag/AgCl as reference). The cyclized product (**2**) was quickly formed in 55% yield (2 g of starting material consumed in 2 h) *via* a two-electron oxidative reaction. The structure of the product, m.p. 256—257°, follows from analytical and spectroscopic data and the fact that on treatment with methanol and hydrochloric acid, under reflux, rearrangement to the methyl ester (**4**; R = Me), m.p. 170—171° occurs. When ethanol is used as the solvent, the ethyl ester (**4**; R = Et), m.p. 155—156°, is produced. The formation of the products (**4**; R = Me) and (**4**; R = Et) may be rationalized *via* the degradation of the intermediate alcohol (**3**; R = H or alkyl) as indicated.



(1)



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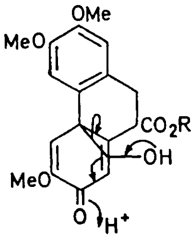

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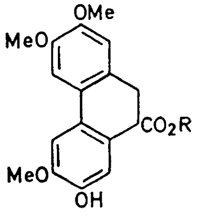

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[1] A. Ronlan and V. D. Parker, *Chem. Comm.*, 1970, 1567; see also A. Bewick and D. Pletcher, 'Organic Electrochemistry—Synthetic Aspects,' in 'Electrochemistry,' vol. 1, Specialist Periodical Reports, Chemical Society, London, 1970, ch. 4, p. 98 and references therein.

[2] L. L. Miller, F. R. Stermitz, and J. R. Falck, *J. Amer. Chem. Soc.*, 1971, **93**, 5941.