

## Potassium *t*-Butoxide-catalysed Oxygenation of an $\alpha$ -Tocopherol Model Compound 2,2,5,7,8-Pentamethylchroman-6-ol

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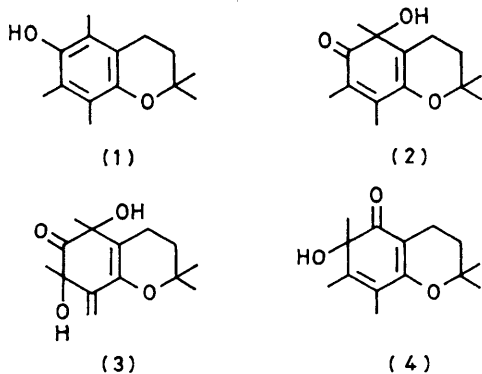
**Summary** The potassium *t*-butoxide-catalysed oxygenation of an  $\alpha$ -tocopherol model compound, 2,2,5,7,8-pentamethylchroman-6-ol, gave 5-hydroxy-2,2,5,7,8-pentamethylchroman-6-ol, 6-hydroxy-2,2,5,7,8-pentamethylchroman-6-ol (2) and 7,8-dihydro-5,7-dihydroxy-8-methylene-2,2,5,7-tetramethylchroman-6-ol (3), and 6-hydroxy-2,2,6,7,8-pentamethylchroman-5-ol (4) which was found to be formed as the result of the acyloin rearrangement of (2).

THE importance of  $\alpha$ -tocopherol, vitamin E, as a biological antioxidant is widely recognized.<sup>1</sup> Its antioxidant mechanisms have, however, been understood only in part. Extensive studies of its oxidation reactions are necessary for the elucidation of vitamin E functions.<sup>2</sup>

5-hydroxy-2,2,5,7,8-pentamethylchroman-6-ol (2) and 7,8-dihydro-5,7-dihydroxy-8-methylene-2,2,5,7-tetramethylchroman-6-ol (3), and 6-hydroxy-2,2,6,7,8-pentamethylchroman-5-ol (4), previously assumed to be (2) and whose structure was revised recently.<sup>3</sup>

Bu<sup>t</sup>OK (1 mmol) in tetrahydrofuran (THF) was added dropwise to a stirred solution of (1) (1 mmol) in THF at 0 °C under an oxygen atmosphere. Three oxidation products [(2), (3), and (4)] were obtained in yields of 8.3, 4.1, and 16.3%, respectively, and were purified by silica gel column chromatography.

Compound (4) was identified on the basis of its spectral data and arises from the reaction of (1) with potassium superoxide (KO<sub>2</sub>).<sup>3,4</sup> Mass spectroscopy and elemental



We report here that Bu<sup>t</sup>OK-catalysed oxygenation of 2,2,5,7,8-pentamethylchroman-6-ol (1), an  $\alpha$ -tocopherol model compound, gave two novel oxidation products,

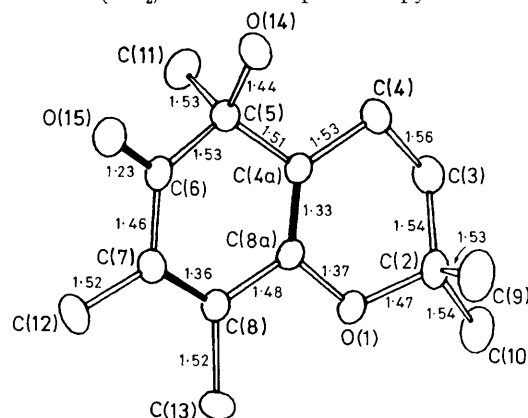


FIGURE 1. The molecular structure of (2) together with bond lengths (Å) for non-hydrogen atoms (mean e.s.d. 0.011 Å). The black bonds represent double bonds.

