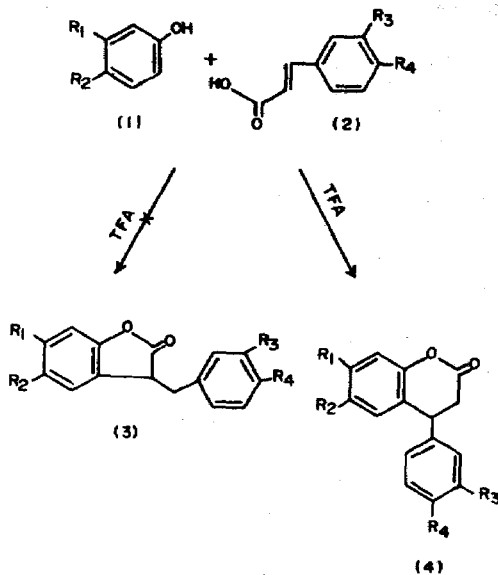


Letter to the Editor

A simple synthesis of 4-aryl-3, 4-dihydrocoumarins

The condensation of phenols (1) and cinnamic acids (2) in the presence of trifluoroacetic acid has been reported¹ to give the corresponding 2,3-dihydrobenzofuran-2-ones (3). Formation of the latter, however, looked doubtful for the simple reason that the lactone carbonyl in the IR spectra of 2,3-dihydrobenzofuran-2-ones shows up²⁻⁴ in the region 1800-1820 cm^{-1} , whereas all the products obtained in ref. 1 consistently gave a band at 1760 cm^{-1} , thus ruling out the former structure (3) for the products. Also, the reported formation of so-called 2,3-dihydrobenzofuran-2-ones looked unsound mechanistically. It seemed to us that the condensation products should be the corresponding 4-aryl-3, 4-dihydrocoumarins (4) since the value of 1760 cm^{-1} shown by the former is quite in agreement with literature⁵⁻⁷ values for the latter type of compounds, the normal range being 1730-1770 cm^{-1} . Further, literature⁵⁻⁸ shows that the particular chemical shifts ($\delta \sim 3.0$, 2H & ~ 4.22 , 1H) observed for the condensation products tally well with the chemical shifts of hydrogens at C-3 and C-4, respectively, of the 4-aryl-3, 4-dihydrocoumarins structure (4). Moreover, the m.p. and spectral data of the product, obtained by Chaturvedi and Mulchandani¹ by condensing resorcinol monomethyl ether and 4-methoxycinnamic acid, were found to agree well with the corresponding data reported by Talapatra *et al.*⁵ for 7-methoxy-4-(4'-methoxyphenyl)-3, 4-dihydrocoumarin. Similarly, the PMR data reported for other condensation products could be fully reconciled with the corresponding 4-aryl-3, 4-dihydrocoumarin structures.

In conclusion, therefore, the condensation of phenols (1) with cinnamic acids (2) in the presence of trifluoroacetic acid provides a good method for the synthesis of 4-aryl-3, 4-dihydrocoumarins (4) and not 2,3-dihydrobenzofuran-2-ones (3) as reported by Chaturvedi and Mulchandani.



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