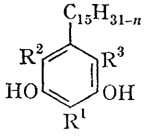
The Identification of a Novel Phenol in Cashew Nut-shell Liquid

By J. H. P. TYMAN

(*Department of Chemistry, Brunel University, London, W.3.*)

THE isolation of a novel phenol which also occurs in the decarboxylated industrial product, has been described[1] in a quantitative study of the compositon of the Cashew nut-shell liquid (*Anacardium occidentale* L.) The saturated material which was chromatographically[2] homogeneous as far as chain length was concerned, and in this respect unlike the wheat bran phenols,[3] had a molecular formula, $C_{22}H_{38}O_2$. The mass and n.m.r. spectra† of the phenol and its methyl ether indicated the presence of an aromatic C–Me group and a side-chain containing 31 protons while the infrared spectrum (prior to hydrogenation) showed no carbonyl or hydrogen-bonded hydroxyl absorption; and along with other chemical and physical properties, indicated a resemblance of the phenol to cardol, (I; $R^1 = R^2 = R^3 = H$; $n = 0$).



(n=0, 2, 4, 6)

(I)

The 4-methyl compound (I; R^1 = Me, $R^2 = R^3$= H; $n = 0$) was prepared by interaction of n-tetradecylmagnesium bromide with 3,5-dimethoxy-4-methylbenzaldehyde (derived from 3,5-dimethoxy-4-methylbenzoic acid by reduction with lithium aluminium hydride reduction followed by oxidation of the benzyl alcohol with chromium trioxide–pyridine) and similarly the 6-methyl compound, (I; R^2 = Me, $R^1 = R^3$ = H; $n = 0$) from 3,5-dimethoxy-6-methylbenzaldehyde, followed in each case by hydrogenolysis and demethylation with pyridine hydrochloride. The saturated phenol from the Cashew nut-shell liquid and its dimethyl ether were identical with the 4-methyl compound, (I; R^1 = Me, $R^2 = R^3$ = H; $n = 0$) and its dimethyl ether in chromatographic, spectroscopic, and other properties.

The *C*-methylation of cardol, (I; $R^1 = R^2 = R^3$ = H) is suggested as the natural mode of formation since the quantitative distribution of unsaturation in the novel phenol resembles that of cardol but possible acidic precursors such as (I; $R^1 = R^2$ =H, $R^3 = CO_2H$) and (I; R^1 = Me, R^2 = H, $R^3 = CO_2H$) have not so far been detected. The specificity in the present instance is in contrast to the number of C–Me and O–Me products found in other natural products[5] and possibly indicates the importance of a steric factor as well as nucleophilic reactivity in biological methylation.

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