UMBELLIFERONE FROM TEA LEAVES

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UDC 547.972

Freshly comminuted tea leaves (200 g) were extracted three times (one liter each time) with 40% methanol with heating. The combined extracts were concentrated to 200 ml and were mixed with 60 g of Sephadex G-25 (coarse fraction). The mixture was transferred to a column (d 4 cm) containing 60 g of Sephadex swollen with 500 ml of water. The column was washed first with petroleum ether (one liter) to extract the fatty acids, then with benzene (one liter) to eliminate the chlorophyll, and finally with chloroform (two liters) [1]. The chloroform eluate was dried and evaporated to dryness.

Paper chromatography of the residue [chloroform system, paper saturated with formamide–methanol (1 : 5)] gave blue spots of three substances: A, B, and C. The main spot – that of substance A – appeared in the region of an authentic sample of umbelliferone. This compound was isolated from the mixture by its separation on Sephadex LH-20. This gave white acicular crystals readily soluble in methanol, ethanol, acetone, ethyl acetate, and chloroform, sparingly soluble in water, and insoluble in benzene and carbon tetrachloride. Substance A had mp 235–237°C and gave no depression of the melting point with an authentic sample of umbelliferone [2, 3]. UV spectrum: $\lambda_{max}^{C_2H_5OH}$ 252, 325 nm. The IR spectrum of this substance was identical with that of umbelliferone [4].

This is the first time that umbelliferone has been isolated from the tea plant.

LITERATURE CITED

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Translated from Khimiya Prirodnykh Soedinenii, No. 1, p. 84, January-February, 1974. Original article submitted June 12, 1973.