Chromatographic Separation of Carotenes and Other Chloroplast Pigments on Aluminium Oxide-Containing Paper

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Whereas many of the hydroxylated carotenoids are readily separated by adsorption chromatography on kieselguhr-containing filter paper[1], the less polar carotenes showed too high mobilities to permit a good separation within the latter group of compounds. It is to be expected that a paper with a stronger adsorbent embedded in it might allow the desired separation to be carried out. On our request the filter paper manufacturers Carl Schleicher & Schüll, Dassel, West Germany, very promptly prepared a filter paper (No. 667) which contained approximately 20 % aluminium oxide. Circular chromatography on this paper using petroleum ether as solvent and following the technique previously described [1], gave satisfactory separation of a series of carotenes as seen from Table 1. It was observed that the separations of chloroplast pigments were generally better on this paper than on the kieselguhr-containing (SS No. 287) paper, the zones being narrower on the former. In addition several mixtures of carotenoids from *Viola tricolor* and from *Ranunculus acris* that exhibited similar R_F-values on the kieselguhr paper were readily separated on the aluminium oxide paper since their relative mobilities were different on this adsorbent.

As expected, the activity of the aluminium oxide-containing paper was dependent on its moisture content. The papers were generally heated at 150°C for 15 min. and then immediately used for the chromatographic separation. Activated papers which were left in the air for even short periods gradually lost their activity to a certain extent. The activation mentioned above secured reproduceable R_F-values and gave the paper an activity comparable to that of aluminium oxide, activity grade 2 of Brockmann and Schodder [2]. (R_F × 100 of azobenzene = 80 in petroleum ether containing 20 % benzene). It is recommended, however, always to add a reference compound, such as β-carotene or azobenzene, and to give the mobilities of the compounds in question relative to that of the test substance.

Table 1. R_F-values of carotenes on Schleicher & Schüll Paper No. 667. Activated at 150°C for 15 min. Solvent: Petroleum ether, boiling range 60–80°C.

Compound	R_F-value × 100	
	Petroleum ether	20 % Benzene
α-Carotene[a]	43	66
β-Carotene[b]	38	62
γ-Carotene[c]	5	15
Phytofluene[c]	77	88
ζ-Carotene[c,d]	36	60
Neurosporene[c,d]	15	25
Lycopene[b]	2	8

[a] From *Gigartina stellata* Batt.
[b] Synthetic product from Hoffman-La Roche & Co. Ltd., Switzerland.
[c] Kindly supplied by the Organic Chemistry Laboratories of The Norwegian Technical University, Trondheim.
[d] 2nd isomer [3].

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Alkaline Hydrolysis of Glycosidic Linkages

V *. The Action of Alkali on Some Methyl Furanosides

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The aim of our studies on the alkaline hydrolysis of glycosidic linkages has been to illuminate possible reactions of the polysaccharides during the alkaline pulping

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