

appears to offer a more convenient and rapid procedure than ordinary paper chromatography.

The apparatus for delivery of a current of constant voltage from 100 V. to 1,000 V. is made by modification of that used by Heigl *et al.* as the constant-voltage generator for the photomultiplier of their Raman-spectrum apparatus². In principle, the apparatus for determining migration distance is similar to that of Durrum, with, however, only one cabinet which contains the supporting glass rod for the filter paper and two vessels for electrolyte solutions into which carbon electrodes are dipped.

In use, a filter-paper strip 0.5–2 cm. wide and 40 cm. long is hung from the glass rod with both ends immersed in electrolyte. After applying the substance on the apex, current is passed for 2–4 hr. and the spots revealed by ultra-violet light (3650 Å.) or spray reagents. The following examples illustrate the method.

(1) *Flavonoids*. The sample is dissolved in formamide, spotted on the centre of the strip and dried. To detect the spots after migration, the paper is immersed in a 5 per cent ethereal solution of lithium aluminium hydride, dried quickly by hot air, and sprayed with water or dilute hydrochloric acid. The spots appear reddish-yellow or dark green, possibly through the formation of lithium or aluminium complex salts.

In Table 1, where borax is used as the electrolyte, it is interesting to note the relation between the number of adjacent *cis*-hydroxyl groups of the sugar, or the number of vicinal dihydroxy groups of the aglycone, and the migration distance.

Table 1

Flavonoid	No. of adjacent <i>cis</i> -OH of sugar	No. of vicinal dihydroxy groups of aglycone	Migration distance to cathode (4 hr.) in mm.
Myricitrin	1	1	30
Rutin	1	1	25
Quercetin	0	1	16
Myricetin	0	1	10
Luteidin-7-glucoside	0	1	3
Naringin	0	1	3
Hesperidin	0	0	3
Acacetin	0	0	3
Morin	0	0	2
Robinin	0	0	2

Current: 500 V., 1.5 m.amp./cm. width. Paper: Toyo filter paper No. 50. Electrolyte: 2 per cent borax solution.

(2) *Sugars*. By application of high-voltage electromigration, all types of sugars may be separated, borax solution proving the best electrolyte (see Table 2).

Table 2

Sugar	Migration distance (4 hr.) in mm.		
	I	II	III
Fructose	+ 67	- 18	- 34
Glucose	+ 56	- 28	- 47
Sorbose	+ 46		- 50
Galactose	+ 84	- 18	- 52
Mannose	+ 21	- 15	- 55
Rhamnose	+ 3	- 22	- 45
Arabinose	+ 21	- 37	- 51
Ribose	+ 57		
Xylose	- 63	- 19	- 46

I: Current 500 V., 1.6 m.amp./cm.; 1 per cent borax.

II: Current 650 V., 0.1 m.amp./cm.; 3 per cent boric acid.

III: Current 760 V., 0.2 m.amp./cm.; 1 per cent boric acid.

Paper: Toyo filter paper No. 50. Spray reagent: aniline hydrogen phthalate (cf. Partridge, ref. 3).

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¹ *J. Amer. Chem. Soc.*, **71**, 2942 (1950). Suzuki, T., and Maegawa, Y., *J. Pharm. Soc. Jap.*, **71**, 1298 (1951).

² *Anal. Chem.*, **22**, 154 (1950).

³ *Nature*, **166**, 997 (1950).

Colorimetric Determination of Formaldehyde under Mild Conditions

IN the course of work on the neutralization of formaldehyde in living bacterial cultures, it was found that the Hantzsch reaction between acetylacetone, ammonia and formaldehyde proceeded so readily at pH 6 that it afforded a good method of estimating microgram amounts of the latter. The yellow colour due to the formation of diacetyl-dihydro-lutidine is fully developed in two hours at room temperature, the molecular extinction being 8,000 at 412 m μ . The reaction will be fully described elsewhere; but a suitable reagent is known to be *M*/20 acetylacetone and *M*/30 acetic acid in molar aqueous ammonium acetate. The only unexpected interfering substance found was sulphite.

Detailed accounts of this work will be submitted elsewhere.

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A Substance in Animal Tissues which stimulates Ketone-Body Excretion

It has been known for many years that the glycosuria of clinical diabetes can be prevented by feeding a very high fat diet. Petren¹ showed that if the fat content of the diet was sufficiently great and if the protein content was restricted, the ketosis of diabetes could likewise be abolished. This observation was confirmed by Marks and Young² in dogs rendered permanently diabetic by the injection of anterior pituitary extract. They showed not only that a diet consisting entirely of beef suet produced a remission of diabetic glycosuria and ketonuria, but also that the addition of raw horse meat to such a diet caused an exacerbation of ketone body excretion. They were able to extract the factor in the horse meat responsible for the ketonuria and demonstrated that this material was not present in significant quantities in casein. Burn, Lewis and Kelsey³ showed that alloxan-diabetic rats could be maintained without glycosuria on a high fat diet. Bornstein and Nelson⁴ extended these observations and noted that alloxan-diabetic rats exhibiting ketonuria on moderately high fat diets ceased to excrete ketone bodies when the fat content of the diet exceeded 70 per cent. Lazaris and Brzezinskaya⁵ demon-