sharp development of the indicator colour by a drop of 0·05 N vanadate solution at a temperature of 50°. In the following

TABLE I

Reduced uranium solution + excess Fe^{+++} + 5·0 ml. of phosphoric acid (1·75 sp. gravity) + 1·0 ml. of 0·1% diphenyl benzidine. Total volume of solution 300 ml. (overall concentration of sulphuric acid above 1·0 N).

Milli equivalents of uranium	
Dichromate method	Vanadate method
0·5095	0·5120
0·4076	0·4076
0·2540	0·2540
0·2038	0·2036

experiments, the U^{++++} solution was rapidly brought to 50° C. in two to three minutes after addition of 3.0 ml. of 1. 0 N oxalic acid and 1.0 ml. of diphenyl benzidine and then quickly titrated with standard sodium vanadate solution to a blue violet colour. The results recorded in Table II show that this direct method also gives accurate results.

TABLE II

Amount of uranium found (in milli equivalents)	
Ceric sulphate method	Vandate method
0·9370	0·9340
0·4298	0·4303
0·3016	0·3009
0·7013	0·7030
0·3562	0·3557
0·6050	0·6046

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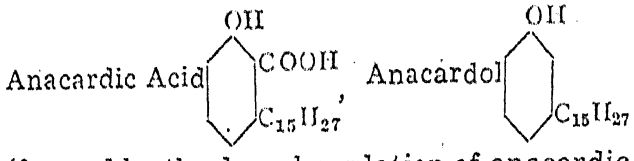
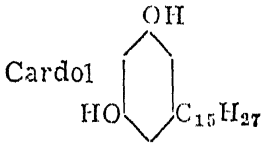
August 25, 1949.

DIELECTRIC CONSTANTS OF CASHEW SHELL OIL

THE dielectric constants of commercial cashew shell oil, the main constituents of which are:—



(formed by the decarboxylation of anacardic acid during the initial heat treatment of the raw oil) and



have been studied. The investigations conducted on six commercial samples from various sources of different compositions reveal:—

(1) Cashew shell oil can be distinguished from cocoanut, linseed, olive, poppy seed, perilla, rape seed, sesame and tung oils (dielectric constants ranging from 3·0 to 3·6 [1–5] at room temperature and audio frequency), by its decidedly higher dielectric constant (4·6). Castor oil has nearly the same dielectric constant as cashew shell oil.

(2) The dielectric constant of the bicarbonate soluble constituent increases continuously with temperature between 30 to 100° C. The neutrals which form a small portion of the oil have a low dielectric constant with a negative temperature coefficient. Temperature variation of the dielectric constant of the oils and their respective bicarbonate insolubles differs considerably. This is attributed to viscosity effects due to self-polymerized products and to the different proportions of anacardol in the two cases.

Complete experimental details are being published elsewhere.

Gen. Chem. Labs., B. R. Y. IYENGAR.
Ind. Inst. of Science, S. KRISHNAMURTHY.
Bangalore 3,
October 4, 1949.

1. Bhattacharya, *Ind. Jour. Phy.*, 1936, **10**, 290. 2. Caldwell and Payne, *Ind. Eng. Chem.*, 1941, **33**, 954. 3. Hazelhurst, *Paint Manfr.*, 1943, **13**, 273. 4. Paranjpe and Deshponde, *Proc. Ind. Acad. Sci.*, 1935, **A-1**, 880. 5. Stoops, *Jour. Phys. Chem.*, 1931, **35**, 1704.

THE TEMPERATURE OF ZERO CONDUCTANCE OF CERTAIN DYESTUFFS

KOHLRAUSCH AND GROTRIAN explained the temperature effect on the conductivity of electrolytes by the following equation:

$$X_t = X_0 [1 + c(t - t_0) + c'(t - t_0)^2]$$

$t_0 = 0°$ or 18° C., c being always positive, whereas c' may for some substances become negative.

Using Kohlrausch's data, the equation

$$X_t = X_{18} [1 + c(t - 18) - c'(t - 18)^2]$$

is generally found to hold good for aqueous solutions between 0° and 35° C., where $c'=0\cdot0163(c-0.0174)$. In some cases, c' equals to $0\cdot0177(c-0\cdot0177)$. Substituting these values in the above equation, we obtain $X_t=X_{18}[1+c\ (t-18)+0.0177\ (c-0\cdot0177)\ (t-18)^2]$. Hence the value of $X_t=0$ when $t=-38\cdot5$° C., *i.e.*, the conductivity vanishes for aqueous solutions below −39° C.

Studying the temperature of zero conductance for jelly-forming salts of thorium, Prakash[1] and recently Mushran and Prakash[2] have determined its value for various negatively charged colloidal systems. Nine out of twelve substances studied by them attain zero conductance between −20° to −30° C.; that of dyestuffs investigated by us also fall in the same range.

Dyes*	Zero conductance temperature
Methylene Blue ..	− 22·5
Fuchsin ..	− 22·0
Aniline Blue ..	− 21·0
Indigo Carmine ..	− 22·0
Bordeaux B ..	− 22·5
Benzopurpurin ..	− 21·5
Congo Red ..	− 21·5
Aniline Brown ..	− 22·5
Methyl Orange ..	− 22·5
Dianilazurin G ..	− 23·5
Aniline Scarlet ..	− 23·0

* Each in 3 concentrations ·05, ·10, ·20 per cent.

Water-soluble dyestuffs are the sodium or potassium salts of dye-forming acids of high molecular weight, or hydrochlorides or sulphates of a dye-base, and consist of: (*a*) ordinary inorganic ions of high mobility; (*b*) a micelle of high molecular weight and low mobility. The former's reaction to temperature will be similar to that of ordinary electrolytes, while the latter will attain zero conductance much earlier when the temperature is lowered. Another contributory factor which is significant in such cases is the association of water molecules, which increases rapidly on lowering the temperature.

Hence it follows that for solutions containing colloidal micelle, the temperature of zero conductance is higher than for ordinary electrolytes. Such would seem to be the case for soaps, dyestuffs, albuminous substances, tannins, etc., and for inorganic colloids.

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University of Allahabad,
August 29, 1949.

1. *Jour. Phys. Chem.*, 1933, **37**, 907. 2. *Ibid.*, 1946, **50**, 251.

OCCURRENCE OF D-MANNITOL IN THE EXUDATION OF *OLEA GLANDULIFERA*

A manna-like substance, an exudation from *Olea glandulifera* ("Sugar tree") in the Aiyur forest is reported to appear during draught and is considered to be caused by incisions wrought by insects. Any artificial injury to the tree failed to induce the exudation.

A sample of this pale yellow exudation, collected in 1946, was found after the removal of fibrous material (Ca 5%) to dissolve freely in hot water. It is practically free of ash, and contains only traces of gelatinous matter and reducing sugars. The aqueous solution, on concentration and chilling or by addition of absolute alcohol (3 vols.) after a clarifying treatment with charcoal, deposited pure crystals of D-mannitol, m.p. 165-6° (identified by mixed m.p. with an authentic sample, by optical rotation before and after addition of borax and by the preparation of mannite-tribenzacetol,[1] m.p. 207°) in about 95 per cent. yield on the basis of water-soluble solids.

Dept. of Biochem., J. SRI RAM.
Ind. Inst. of Sci., P. L. NARASIMHA RAO.
Bangalore,
October 31, 1949.

1. *Identification of Pure Organic Compounds* by S. P. Mulliken, Vol. I, p. 155.

A SYNTHESIS OF PRUNETIN

THE action of ethyl orthoformate on 2-hydroxy-4:6-dimethoxypnenyl 4-nitrobenzyl ketone (I) in boiling pyridine containing a little piperidine yields 5:7-dimethoxy-4′-nitroisoflavone (II) in 60% yield. Prunetin (III) has been synthesized from (I) by