

The author's thanks are due to Dr. Satya Prakash for his very kind interest in this work.

Chemical Laboratories, S. P. MURBAN,
The University, Malabar,
December 20, 1948.

1. *Masani, J. Ind. Chem.*, 1946, **14**, 200; 1946, **15**, 250; *Nature*, 1946, **153**, 96. 2. *Prace i Badania Chemiczne*, 1929, **6**, 587.

CHEMICAL INVESTIGATION OF THE SEEDS OF *JATROPHA CURCAS* LINN.

Jatropha curcas is well known for its seeds which have purgative properties. It is also used in the case of Rheumatism and Hep. The juice of the plant is also reported to contain some coloring matter. As the plant is common in the Tropics, the juice and seeds have already been examined by various investigators. The analysis of two indigenous samples from Malabar and Bihar have been reported. For. et. Alimchandani and Meon¹. The plant is common throughout the country, but its seed-oil is not utilised for any industrial purpose. In Gujarat, the forest areas abound in these plants, so the seeds were collected from Rajpipla State and the oil and other constituents are being investigated in the laboratory with a view to find the suitability of the oil for industrial use for paint and textile purpose and whether the constituents contain any alkaloid.

The seeds were extracted with carbon tetrachloride for their oil content. The extract after complete removal of the solvent gave bright yellow oil, with not unpleasant smell, which was examined chemically. The yield is 44 per cent.

Jatropha curcas obtained from Rajpipla State (Gujarat). Constants of Oil.

S.P. Gr. at 20° C.	..	0.9440
Refractive Index at 25.5° C.	..	1.475
Saponification value	..	200.8
Acid value	..	16.5
Iodine value (Wijs)	..	88.0
Acid value	..	2.6
Acid value in terms of Oleic Acid	..	1.307
Unsaponifiable matter	..	1.19%
R.I. Reading at 40° C.	..	55.0
R.W. value	..	0.9
P value	..	0.1

Constants of Mixed Acids

Iodine value	..	94.7
Saponification equivalent	..	287.7

Constants of Solid Acids

Iodine value	..	2.9
Saponification equivalent	..	276.7

Constants of Liquid Acids

Saponification equivalent	..	291.3
Iodine value	..	111.0

Per cent. of Saturated Acids is 26.5

Per cent. of Unsaturated Acids is 73.5

The further work as regards fractionation of different fatty acid methyl esters, the suitability of the oil for industrial purpose and the isolation of the alkaloids, if any, is in progress. Chemistry Department,
M.T.B. College,
Surat,

C. M. DESAI.

M. T. VYAS.

December 16, 1948.

1. Alimchandani and others, *J. Univ. B.M.*, 1945, **14**, 31; Kartha and Menon, *Proc. Ind. Acad. Sci.*, 1943, **18**, 160; Cruz and West, *J. C.S. I.*, 1937, **31**, 4518; Karika, *Zell.*, 1933, **27**, **1**, 133; *Adh. Ind. Ind.*, 1936, **30**, 5449; Ellis, *Zell.*, 1914, **8**, 531.

THE DINITRATION OF META-CHLORACETANILIDE

In connection with our studies of the factors involved in the elimination of the nitro-group during the diazotisation of certain nitranilines, it became necessary to prepare a pure sample of 4:6 dinitro-3-chloro aniline in quantity. This compound has been described by Nietzki and Schedler¹ and later by Fries and Roth² who both obtained it by the same method, viz., the action of alcoholic ammonia on 4:6-dichloro-1,3-dinitro benzene as yellow needles melting at 174° C. (Nietzki and Schedler) or 178° C. (Fries and Roth). Later, Nietzki and Zänker³ claimed to have prepared it from 5-chloro-1,2,4-trinitro benzene by the same method. Since the methods mentioned above require the preparation of the intermediates themselves by the chlorination or nitration of suitable benzene derivatives, it was considered to be a more convenient and simple process to start with *m*-chloroacetanilide and dinitrate it in one step to the required compound by suitable means.

In an earlier publication⁴ it was mentioned that *m*-chloroacetanilide, when treated with a mixture of potassium nitrate and sulphuric acid was nitrated mainly in the 4-position (C1-3) whilst the use of nitric acid as such resulted in an isomeric mixture of 4- and 6-mononitro-chloroacetanilide; which was extremely difficult to separate. Further nitration of either the isomeric mixture, or of the pure mononitro compound with the same but fresh reagent failed to give the desired dinitro compound.

According to Kehrman and Stanoyevitch⁵ when *m*-chloroacetanilide was added in small amounts to a well-stirred mixture of one part of nitric acid (1.52 d.) to three parts of

sulphuric acid (1.8 d.) kept at 0° C., only 4:6-dinitro-3-chlor-acetanilide resulted, but the yield was not specified. This was identified by the free amine (m.p. 174° C.—cf. N & S) liberated on hydrolysis with dilute sulphuric acid. On repeating this dinitration in the manner described, the desired product (m.p. 174° C.; acetyl derivative m.p. 136° C.) was obtained, but in a yield of only 10% mixed with an almost equal amount of the mononitro derivative, *viz.*, 4-nitro-3-chlor aniline (m.p. 157° C.—acetyl derivative m.p. 144° C.). A neat method of separation of these two nitro compounds has been worked out by us on the basis of the general principle that a dinitro benzenoid base was comparatively less basic than its mononitro counterpart and was therefore less liable to form soluble salts in acid media. In fact, when the crystallised product of dinitration consisting of a mixture of the acetyl derivatives of the mono- and dinitro chloranilines was hydrolysed using 50% dilute sulphuric acid, the mono-nitro base remained in the cold solution while the free dinitro base remained insoluble and could be filtered off and was found invariably to be pure—the mononitro amine could also be obtained pure from the filtrate by dilution with water and filtration.

The formation of both mono- and dinitro derivatives during the nitration in the manner described seems to have escaped the attention of Kehrmann and Stanoyevitch. However, the presence of monoderivative clearly shows that the dinitration is a two-stage operation and that, in the first place, the 4-position is occupied by the entering nitro group and it was only after that that the 6-position was attacked. The latter position is obviously more resistant towards nitration, as is indicated not only by the poor yield of the 4:6-dinitro body but also by the total absence of the 6-nitro mono derivative in the nitration products. It was thought probable that the non-completion of the nitration of the mono-nitro derivative to the dinitro stage was also partly due to the dilution of the acid mixture employed and its consequent ineffectiveness in attacking a position already resistant and made more so by the groups already existing in the molecule. A remedy for this appeared to lie in the employment of a mixture of nitric acid (1.52 d.) and fuming sulphuric acid (12% oleum); the dinitro compound was then observed to be the sole product of nitration, to the complete exclusion of the mono-nitro derivative. The yield of the required dinitro base was also found to have

increased almost to double. Further, on repeating the same procedure, starting with the 4-nitro-3-chloro acetanilide obtained by the nitrate-sulphuric acid mixture (yield 54% *loc. cit.*), the same yield of dinitro base resulted thus furnishing further evidence for the two-stage character of the dinitration and also the possible explanation for the non-completion of the dinitration when the Kehrmann and Stanoyevitch acid mixture was employed. Further details will be published elsewhere.

Our thanks are due to the C.S.I.R., India, for a grant which defrayed the expense of this investigation and for permission to publish the preliminary results. We also record our thanks to Prof. R. D. Desai of the Department of Chemical Technology, University of Bombay, for a further gift of 100 gm. of *m*-chloraniline-HCl.

Chemical Laboratories, B. B. DEY,
Presidency College, R. KRISHNA MALLER,
Madras, B. R. PAI.
January 1, 1949.

1. Nietzki and Scheller, *Ber.*, **30**, 1006. 2. Fieser and Roth, *Ann.*, **389**, 344. 3. Nietzki and Zanker, *Ber.*, **36**, 3955. 4. Dey, Mallier and Pai, *Chem. Sci.*, **17**, 230. 5. Kehrmann and Stanoyevitch, *Mosc. Chem. L.*, 1925, **8**, 663-8.

PRELIMINARY ANTIMALARIAL SCREENING TESTS OF SOME BIGUANIDE DERIVATIVES

A number of communications¹⁻⁵ have been published by us, on the synthesis of new potential antimalarials of the substituted biguanide type. The results of testing of some of these compounds against avian and simian malarial are now reported.

Avian Malaria Tests. Although the synthetic compounds could be tested in a number of ways in the light of recent developments in the field of antimalarial testing^{6,7} but for the present work as a preliminary screening test, only the suppressive antimalarial activity of the compounds against the blood induced infection of *Plasmodium gallinaceum* in chicks, has been evaluated. Young cross breed country fowls, 8-10 weeks old, were infected intramuscularly with citrated blood freshly drawn from control birds showing peak infection. The size of the inoculum was so adjusted that the control group showed peak infection after 8-10 days invariably. Treatment group was orally fed with the requisite