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A REINVESTIGATION OF THE CONSTITUENTS OF PEGANUM HARMALA

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BASE CATALYSED HALOGENATION OF ALIPHATIC ALDEHYDES

Part I.—Iodination of Acetaldehyde

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Iodination of acetaldehyde has been carried out in the presence of large excess of alkali. The reaction does not take place strictly according to the equation:

$$CH_3CHO + 3I_2 + 4NaOH = CHI_3 + HCOONa + 3NaI + 3H_2O$$

In addition to the normal products predicted by this equation, acetic acid and monoiodoacetic acid were also found showing thereby that the halogenation is followed by the oxidation of acetaldehyde. The low consumption of iodine per mole of acetaldehyde was probably due to some aldol condensation in the presence of alkali. The rate of halogenation was found to be controlled by the order of mixing the reactants and alkali concentration but independent of the iodine concentration.

STUDIES IN THE PREPARATION OF OXIDATION-RESISTANT MODIFIED ROSINS

Part I.—Use of Sulphur for the Modification of Rosin and its Esters

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A study of the rosin-sulphur reaction with a view to reducing the oxidation properties of rosin has been carried out. It has been found that the treatment of rosin with sulphur (5%) at 240–50°C. for one hour reduces the oxidation properties of rosin and its esters to negligible proportions. Data of the physical properties and oxygen absorption of the sulphur-treated resins and the methods of treatment are presented in this paper.

ION-EXCHANGE FLAME PHOTOMETERIC DETERMINATION OF SODIUM, POTASSIUM, CALCIUM AND MAGNESIUM IN THE ASH OF TOBACCO AND OTHER PLANTS

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Na, K, Ca and Mg in the presence of anions like phosphate and sulphate are estimated here in plant ash using Unicam Sp 900 flame spectro photometer. The interference of the anions and cations with each other has been overcome by using cation-exchange resin. The results are compared with those obtained by conventional procedures.

STUDIES ON SODIUM HYPOPHOSPHATES

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The oxidation of red phosphorus into sodium hypophosphate with an aqueous extract of bleaching powder was carried out at 12—15°C. and an increase in the yield by 15% was noticed. However, when the oxidation was undertaken with sodium chlorite solution, having a small proportion of sodium hypochlorite, the yield was found to be higher than that achieved by the previous methods. Infrared spectra and magnetic susceptibility were determined to ellucidate the structure of $Na_4P_2O_6.10H_2O$.

RAW LEADLESS OPAQUE GLAZES AT CONE4

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The investigation covers three aspects of raw leadless, boron-free, opaque glazes maturing at Cone 4. Studies have been made of the effect of (1) the RO fluxes (calcium, barium, magnesium, strontium and zinc oxides) upon fusibility, gloss and texture, (2) the variation of alumina-silica ratio for a promising glaze composition and (3) tin oxide, titania and zirconia, on the opacity and colour. Some typical glaze compositions for bright and mat glazes have been suggested to be tried on an industrial scale. They are the whitest with excellent gloss and opacity.

FATTY ACID COMPOSITION OF VARIOUS PARTS OF A POLLED ANGUS STEER*

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(Received August 19, 1963)

Fatty acid composition of different parts of a Polled Angus Steer of known age, breed and history was determined by gas-liquid chromatographic analysis. Fatty acids obtained after removal of the unsaponifiable matters from a freshly rendered fat were converted into methyl esters by methanol-acid method. Quantitative estimations of the fatty acids were based on the total area (retention volume) method of analysis and the identifications of fatty acids were done from a study of relative retention time. Standards were used separately. Diethylene glycol adipate was used as a stationary phase in a 8 ft. column packed with graded celite. Details concerning procedures used and the results obtained are presented in this paper.

THE ROLE OF TRANSPIRATION IN THE ABSORPTION AND TRANSLOCATION OF MINERAL SALTS IN PLANTS

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Cotton and bean plants were grown in solution culture and during the light period one set was kept in a mineral nutrient solution and another set in distilled water. During the dark period the treatment of two sets was reversed. The concentration of culture solution was such in which the plants grow slightly less well than plants growing in full concentration. This presumably prevented the accumulation of minerals in the root. The height and dry weights of the plants of both the sets were determined at the end of the experiments. The observation indicated that higher transpiration rate during the period of mineral salt availability is responsible for greater absorption of salts and better growth.

STUDIES ON THE FUNGI OCCURRING AS LABORATORY CONTAMINANTS

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A routine subculture was continued to isolate the fungi occurring as laboratory contaminants. In all, nineteen species have been identified. Most of the isolated fungi belong to the genus *Aspergillus*. Two species of *Aspergillus*, viz, *Aspergillus nidulans* and *Aspergillus chevalieri* definitely belong to Ascomycetes in view of the presence of perithecia containing asci and ascospores. The two fungi of the genus *Aspergillus* and *Spicaria* which have been considered as varieties *de novo* are *Aspergillus chevalieri var prolitrans* and *Spicaria divaricata var. heterospora* owing to the proliferation phialides and the presence of two types of spores, respectively.

ANATOMICAL STUDY OF THE STEM AND LEAF OF LIPPIA NODIFLORA MICH

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(Received February 26, 1963)

The macro and microscopic characters of the leaf and stem of *Lippia nodiflora* Mich, have been described. The young stem is characterized by the presence of collenchyma bands at the ridges while in the older stem the collenchyma encircles the entire cortex. **The most distinguishing character of the stem is the presence of unicellular two-armed trichomes on it.** The leaf is isobilateral but the palisade cells towards the upper epidermis are longer than those towards the lower epidermis. The characteristic feature of the leaf is the presence of large water-storage cells beneath the epidermis and in between the palisade cells. Trichomes resembling the stem trichomes are also present.

BOTANICAL PHARMACOGNOSTIC STUDY OF RHAZYA STRICTA DECAISNE

Part I.—Stem and Leaf

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The macroscopic and microscopic characters of the stem and leaf of *Rhazya stricta* Decaisne are described

The stem is characterized by the presence of large amount of included phloem bands in the xylem and internal phloem. Periderm is formed superficially just below the epidermis unlike *Rhazya orientalis*, in which it is deep seated.[1] Presence of non-articulated branched and non-articulated unbranched laticifers and the absence of crystals in the stem tissues are the distinguishing characters. The leaf is isobilateral and is characterized by the absence of trichomes on both the surfaces and the presence of an arc shaped xylem. Internal phloem is also present like the stem.

A CONTRIBUTION TO THE ANATOMY OF TINOSPORA CORDIFOLIA (WILLD) MIERS

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The macroscopic and microscopic characters of the stem and leaf of *Tinospora cordifolia* (Willd) Miers, are described.

The stem is characterised by the presence of a brownish, scaly periderms. There is also a complete ring of sclerenchymatous pericycle encircling the vascular region. Secretory sacs and idioblasts are scattered in the cortex and pith. The vascular bundles retain their separate entity even after secondary growth. The medullary rays are very broad. Vessels are small in length but large in diameter.

The petiole structure differs in different regions. In the basal part it resembles the young stem in having a ring of sclerenchymatous pericycle, while in the upper distal part the pericycle is altogether absent. Leaf shows a typical bifacial structure with a small amount of collenchyma in the midrib. The vascular bundle is enclosed in a bundle sheath. Idioblasts and secretory sacs like stem are also present in the spongy parenchyma.

STUDY OF THE SPECIES OF CLOSTRIDIA INVOLVED IN RETTING OF JUTE

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Several anaerobic bacteria were isolated from retted jute fibres (*Corchorus capsularis* L.). Of the several isolates, only *Clostridium Sp*$_1$ and *Clostridium Sp*$_2$ retted jute stem in the laboratory in relatively much shorter time releasing better fibres.

UTILIZATION OF BALCRETE FOAMING AGENT

Part III.—Production of Air-entrained Concrete

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This paper describes the use of 'Balcrete' foaming agent as air-entraining agent for entraining air in cement concrete. The addition of Balcrete, in small quantities, increases the compressive strength of concrete made with less graded aggregates. The increased water-repelling property suggests the use of air-entrained concrete where chemical resistance is required. The other uses of Balcrete as retarder and wetting agent are also briefly discussed.

DISCHARGE PHENOMENON AS A TOOL IN THE DYNAMIC MEASUREMENT OF THICKNESS OF THIN OIL FILMS BETWEEN HEAVILY LOADED MACHINE ELEMENTS

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The load-carrying capacity of machine elements, such as gears and roller bearings, depends on the lubricant film thickness that may be sustained between the loaded surfaces. This paper describes one of the methods of direct measurement of oil films called the discharge voltage method and presents a presumptive theory for the discharge phenomenon in oils. Some of the author's results using discharge voltage technique are presented together with his conclusions pertaining to the applicability of the method to running gears. With a better and more comprehensive calibration of discharge voltage, the quantitative interpretation of the results is expected to be reliable.

SHORT COMMUNICATION

SOME NEW HOSTS OF MACROPHOMINA PHASEOLI (MAUBL.) ASHBY

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EFFECT OF STEAMING ON THE EXTRACTIVES OF GURJAN (DIPTEROCARPUS SPP.)

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PREPARATION OF COLLOIDAL BISMUTH HYDROXIDE

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A NEW TECHNIQUE FOR MACERATION OF FIBRE TISSUES

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