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Physical Sciences Section

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THERMAL STUDIES ON ALUMINIUM(III) 2-SUBSTITUTED-8-HYDROXYQUINOLATES

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(Received October 27, 1977; revised April 4, 1978)

The thermal behaviour of some aluminium(III)-2-substituted-8-hydroxyquinolates has been studied by thermogravimetry. Derivatives of 8-hydroxyquinolines used as ligands were 2-methyl-, 2,5-dimethyl-, 2-methyl-5-chloro-, 2,3,4- trimethyl- and 2,3-dimethyl-8-hydroxyquinolines. All the aluminium(III) chelates studied in the present investigations were found to be thermally less stable than unsubstituted chelate, aluminium(III)-8-hydroxyquinolate. The thermal characteristics and stability of the tris-chelates were found to be different from those of bis-chelates. Complete decomposition of the chelates was accomplished in two or three stages. The intermediate compounds corresponding to a horizontal portion of the thermograms were analysed and studied using IR and mass spectral techniques.

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THE REACTIONS OF ORGANOMETALLIC COMPOUNDS INVOLVING SILICON

Reactions of Triphenyl-, Diphenylmethyl-, and Phenyldimethylsilyl potassium with Fluorene in Tetrahydrofuran

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(Received August 20, 1977)

Triphenylsilylpotassium (Ph_3SiK), diphenlylmethylsilylpotassium (Ph_2MeSiK), and phenyldimethylsilylpotassium ($PhMe_2SiK$) react very rapidly with fluorene in tetrahydrofuran (THF). The reactions can be followed at low temperatures using a stop-flow technique. The thermodynamic constants of activation was calculated for the reactions of organosilylpotassium (R_3SiK) with fluorene for —50°. The results were compared with the corresponding reactions of organosilyllithium (R_3SiLi), and organosilylsodium (R_3SiNa) with fluorene, also calculated for —50°. The bimolecular rate constanat k increases with the increase in radius of cation. The sequence for the $\Delta H‡$ and $\Delta S‡$ values, $R_3SiNa \angle R_3SiK \angle R_3SiLi$, parallels that for the A factor. The electronic spectra of R_3SiK and 9-fluorenylpotassium were determined at temperature varying from +20 to —80°. The special results are in full agreement with the kinetic results, that R_3SiK compounds exist as contact ion pairs in THF and the cation plays an important role in determining the rate of these reactions.

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MASS SPECTRAL FRAGMENTATION OF t-BUTYL GLYCIDIC ESTERS

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A number of t-butyl glycidic esters were prepared and they were subjected to mass spectral fragmentation analysis. The pattern of fragmentation supports the formation of tropylium ion as intermediates.

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CONDENSATION OF ETHYL α-ACETYLCINNAMATES WITH THIOUREAS

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Dihydropyrimidinethiones can be obtained by the reaction of various ethyl α-acetylcinnamates with thioureas or ammonium thiocyanate.

Short Communications

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OXIDATION OF 2-(4-HYDROXYPHENYL)-3-METHYLINDOLE WITH HYDROGEN PEROXIDE

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to afford *N*-(2-acetophenyl-4-hydroxybenzamide)(III) as white need'es m.p. 214-215° (0.24 g, 44%). (Found C, 70.8; H, 5.0; N 5.3; *m/e*, 255. $C_{15}H_{13}NO_3$ requires: C, 70.8: H, 5.1; N, 5.5%; mol wt. 255) λ_{max} 218, 248 and 341 nm (log ε = 4.48, 4.37 and 4.03): λ infel 279 nm (log ε 4.04); ν max 3330, 3180 (NH;OH), 1655 and 1640 cm^{-1} (CO,NHCO).

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Biological Sciences Section

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INDIVIDUAL REARING AND SINGLE PAIR OVIPOSITION RESULTS OF PECTINOPHORA GOSSYPIELLA (SAUNDERS) DEVELOPED ON BEAN CONTAINING DIET LEPIDOPTERA: GELICHIDEA

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(Received June, 22, 1977; revised March 15, 1978)

The apparatus and procedure used in rearing of *Pectinophora gossypiella* (Saunders) from 1st instar to full grown larvae including data on full grown larval recovery percentage, number of larvae recovered, temperature range and total larval period are described. Studies on single pair oviposition experiments include informations on fecundity, longevity of the adult pink bollworm female and ranges of temperature and humidity.

Technology Section

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STUDIES ON THE DIFFERENT PARTS OF THE FLEECE OF HASHTNAGRI SHEEP

Part III. Nonuniformity in Dyeing of Root, Middle and Tip Portion of Wool Fibres

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(Received February 7, 1977; revised December 6, 1977)

Samples of the five different parts of Hashtnagri fleece were collected from the autumn clip and the fibre samples were prepared by cutting equal segments of root, middle and tip portion. The damage to the samples was determined by the alkali solubility method. Tip, middle and root portions were dyed by using acid, reactive and basic dyes. The results on the variations in dye uptake of the three segments in the various parts of the fleece have been discussed.

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STUDIES ON THE ESSENTIAL OILS OF THE PAKISTANI SPECIES OF THE FAMILY UMBELLIFERAE

Part XVIII. *Platytaenia lasiocarpa* sp. Thomsonii seed Oil

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(Received January 1, 1978)

The essential oil of *Platytaenia lasiocarpa* seed with a yield of 0.28% has been characterised with respect to its physicochemical values and chemical composition. The oil is composed of β-pinene (0.14%), *p*-cymene (1.43%), phellandrene (0.70%), γ-terpinene (1.59%), terpinolene (4.78%), γ-cadinene (3.56%), α-cadinene (0.98%), β-bisabolene (2.00%), isolongifolene (17.93%), β-elemene (14.34%), unknown sesquiterpene (15.05%), β-selinene (0.89%), β-caryophyllene (2.43%), humulene (3.93%), octyl acetate (13.82%), geranyl acetate (10.03%), unknown ester (0.56%), bornyl acetate (5.25%), linalyl acetate (0.75%) and an unidentified ester (0.47%). Because of its sweet flavour the essential oil of the species can be used in perfumery and cosmetics.

an adsorbent, proved ineffective because of the com-

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STUDIES ON THE ESSENTIAL OILS OF THE PAKISTANI SPECIES OF THE FAMILY UMBELLIFERAE

Part XIX. *Ferula ovina* Boiss (Kamyan) Oils Distillied from the Mature and the Immature Seeds and the Roots of the Plant

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(Received January 1, 1978)

The essential oil of the mature and the immature seeds and the roots of *Ferula ovina*, which grows wild in Pakistan has been studied for the first time with respect to its physicochemical constants and chemical composition. The mature seed from two separate places namely Zargoon and Hazarganji in Baluchistan contain 1.0% and 1.2% essential oil respectively. The immature seed at two different stages of maturation and the roots of Hazarganji contain 2.5, 1.3 and 0.8% of essential oil respectively. The essential oils of the mature seeds of Zargoon and Hazarganji, the immature seeds at two different stages and the roots of Hazarganji respectively contain α-pinene (70.6, 62.2, 53.7, 57.1, 13.8%), camphene (7.9, 12.0, 16.7, 14.2, 9.5%), β-pinene (0.8, 2.1, 3.5, 3.0, 2.8%), myrcene (5.8, 6.6, 11.4, 9.8, 10.0%), limonene (3.5, 5.1, 7.6, 6.8, 14.2%), γ-terpinene (0.1, 0.2,2.0, 1.1, 1.4%) *p*-cymene (traces, traces, 0.0, 0.9%), bornyl acetate (1.2, 0.35, 0.6, 0.6, 0.4, 1.2%), terpinyl acetate (0.8, 0.7, 0, 0.2, 0.8%), geranyl acetate (0.3, 0, 0, 0, 0%), fenchyl acetate (0, 0, 0, 0, 0.5%), camphor (0.3, 0.2, 0.2, 0.8, 7.8%), fenchone (0.2, 0, 0, 0, 4.1%), fenchyl alcohol (0, 0, 0, 0, 8.6%), α-terpineol (2.1, 3.6, 1.0, 1.6, 2.4%), geraniol (2.3, 0, 0, 0, 0%), borneol (1.9, 5.3, 2.5, 3.6, 19.0%) and a mixture of coumarins (1.9, 1.8, 0.7, 1.4, 3.0%). The oils obtained from the seeds of two distinct localities and at two stages of its maturation in the same locality and from the roots of the mature plant were studied. The presence of sulphur compounds was not detected in any one of these oils.

Short Communications

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VAPORISATION AND RESIDUE OF LINDANE ON CHICKPEAS (CICER ARIENTINUM) STORED AT ABOUT 32°C IN LABORATORY

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by washing with 50 ml of hexane. The water-washed seed was then extracted with about 50 ml hexane-acetone in the ratio of 10:1 by first leaving the seed overnight in the solvent mixture and then crushing in multimixer. Some additional quantities of solvent mixture were used to compensate for losses due to evaporation. The solvent mixture was then filtered and the residue given three washings with 15 ml of the same solvent mixture. The filtrate was then washed twice, each time with 25 ml distilled water, to remove acetone from the extracts. The resultant hexane extracts were made up to 5.0 ml in volumetric flasks and 1 ml portion of each such extract was counted for radioactivity in a liquid scintillation counter. The residue of chickpeas obtained after filtration

and the WHO Expert Committee on Pesticide (FAO, Rome, 1974), 42 pp.

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CHANGES IN DTPA-EXTRACTABLE Zn, Cu, Fe AND Mn IN TWO ALKALINE CALCAREOUS SOILS FOLLOWED BY SUCROSE APPLICATION

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MATERIALS AND METHODS

The experiment was carried out in the laboratory. Two soils (0-15 cm) differing in texture were collected from Thikriwala and Kamalia towns of Faisalabad district. They were air-dried and ground to pass through a 2-mm mesh plastic sieve. Physicochemical characteristics of the soils used have been detailed elsewhere [7]. Twenty-five g portions of the soils for each treatment were taken in flat-bottomed plastic vessels. The treatments in triplicate consisted of 0, 2.5, 5.0 and 10.0 ppm Zn as $ZnSO_4.7H_2O$ and 0, 2, 4 and 8 ton/ha organic matter as sucrose. Sucrose and Zn salt were applied as aqueous solutions by adjusting the moisture level of the soil in each vessel to 75% of its field capacity. The soils maintained at this moisture level were incubated at $30\pm1°$ for 13 days— a period found sufficient for maximum fixation of Zn (data not shown). At the end of the incubation period, the soil samples were extracted with 0.005*M* DTPA (diethylenetriamine-

Reveiw

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RECOVERY OF METALLIC COPPER FROM ACID LEACH SOLUTION
Part I

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MASS SPECTRAL STUDIES ON DIMORPHOLINOETHANE

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STUDIES ON THE ESSENTIAL OILS OF THE PAKISTANI SPECIES OF THE FAMILY UMBELLIFERAE

Part XVII. *Heracleum candicans* (Eng. Cowparsnip. var. Morchar) Seed Oil

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(Received January 1, 1978)

The chemical composition of the essential oil of the fresh and mature seeds of *Heracleum candicans* collected from Murree and Kalam has been determined. The oil from the seeds of the respective localities obtained in 0.65% and 0.82% yields, is composed of α-pinene (0.27, 0.15%), *p*-cymene (0.82, 0 %), limonene (2.66, 0.15%), curcumene (0.23, 0%), β-bisabolene (0.23, 0%), cadinene (0.57, 0.64%), β-selinene (0, 0.21%), β-elemene (0, 0.17%), butyl butyrate (0, 0.15%), isobutyl-2-methyl butyrate (1.41, 4.45%), n-butyl isovalerate (1.26, 10.98%), n-hexyl-isobutyrate (2.21, 2.12%), butyl hexanoate (3.00, 1.13%), octyl acetate (4.50, 6.00%), hexyl-pentanoate (16.90, 3. 83%) amyl acetate (10.94, 19.57%), bornyl acetate (27.12, 21.45%), hexyl caproate (9.65, 8.67%), neryl acetate (0, 0.32%), linalool (1.04, 0%), santenol (0.57, 0%), capric acid (14.08, 0%), lauric acid (0.14, 14.0%), myristic acid (0,14.27%), palmitic acid (0, 4.21%) and santalic acid (0, 0.14%). By virtue of its fragrance the essential oil of the species holds good promise of being commercialised.