Physical Sciences Section

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THE PREPARATION AND SPECTROSCOPIC PROPERTIES OF SOME COMPLEXES FORMED BETWEEN VANADIUM (4) OXYDICHLORIDE AND ORGANIC LIGANDS

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The complexes of vanadium (4) oxydichloride with tetrahydrofuran, 1, 2 - dimethoxyethane, pyridine and picolines were prepared having general formulae $VOCl_2L'_2$, $VOCl_2L''$ and $VOCl_2L'L''$(here L′ = tetrahydrofuran, and L″ = 1, 2 - dimethoxyethane, pyridine or picoline). The infrared spectra of complexes were determined in nujol and hexachlorobutadiene (HCB) mull and assignments of vanadium - oxygen double bond ν (V=0), vanadium - oxygen single bond ν (V–0), vanadium - nitrogen ν (V–N), and vanadium - chlorine ν (V–Cl) stretching vibrations were made. The electronic spectra of complexes were determined in dimethoxyethane and toluene solution. The $\lambda_{max.}$ in electronic spectra of the complexes was shifted to longer wavelength by less polar solvent. This red shift in the $\lambda_{max.}$ was discussed by considering that the dipole moment of the complexes was changed during transition. The possible structural formations of the complexes were propcsed.

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EFFECTS OF INORGANIC SALTS ON THE COPOLYMERIZATION OF VINYL AND ALLYL MONOMERS

Part-VII Copolymerization of Styrene and Methyl Acrylate in the Presence of Some Inorganic Salts

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(Received April 7, 1984)

The thermal copolymerization of styrene and methyl acrylate in the presence of $CoCl_2$, $SrCl_2$, $CdCl_2$, $ZnCl_2$ and $PtCl_6$ has been investigated. Platinic chloride decreased the rate of copolymerization whereas the rest of the salts accelerate the rate. These salts act as chain transfer agents and do not change the reactivity ratio values of the monomers appreciably.

INTRODUCTION

BDH cobalt chloride ($CoCl_2 \cdot 6H_2O$), strontium chloride

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SYNTHESIS OF TRISUBSTITUTED PYRAZOLES WITH POSSIBLE ANTIMICROBIAL ACTIVITY

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(Received August 13, 1984; Review Dec. 17, 1984)

Several 2,5-disubstituted oxadiazoles and 1,3,5-trisubstituted pyrazoles have been synthesized. Condensation of 2-aryl-4-formyl triazoles with acylhydrazines affored the corresponding acylhydrazones, which upon oxidation with iodine-mercuric oxide mixture in dry ether gave the corresponding 2,5-disubstituted oxadiazoles.

Similarly, condensation of α, β-unsaturated ketones with arylhydrazines, afforded the corresponding arylhydrazones. Heating with ethanolic hydrogen chloride gave the corresponding pyrazolines. Oxidation of the pyrazolines with bromine water gave the brominated pyrazole derivatives.

On the other hand, condensation of α, β-unsaturated ketones with ethyl oxalate gave ethyl 2,4-cioxo-6-substituted hex-5-enoate which with arylhydrazines gave the corresponding pyrazole-3-esters.

The structure of the synthesized compounds was affirmed by m.p., microanalysis, i.r., p.m.r. and m.s. spectral analysis.

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SAPONIFICATION OF POLY(VINYL ACETATE) IN AQUEOUS ALCOHOLIC SOLUTIONS

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(Received May 28, 1983; revised, February 19, 1985)

Saponification of poly(vinyl aceate) PV-OAc, in various methanol/H_2O and ethanol H_2O mixtures was studied using NaOH as catalyst. The rate of reaction was dependent upon temperature and solvent compositions and it followed second order kinetics in the initial stages of the reaction. In mixtures richer in water in ethanol/H_2O system, the rate was enhanced by a closer coiling of the macromolecules. Viscosity measurements of the polymer solutions revealed the state of coiling of the polymer molecules. Partially soluble polymers exhibited autocatalytic properties.

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VOLTAMETRIC METHOD FOR THE DETERMINATION OF SULPHUR: A PLASTICIZED SULPHUR CONSTRUCTION MATERIAL

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Electrochemistry Group, Quaid-i-Azam University, Islamabad

(Received April 26, 1984)

A new voltametric method for the determination of sulphur has been developed. The method, though general, was particularly found useful in the monitoring of plasticization reaction of sulphur where many analytical techniques were found inapplicable.

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GAS CHROMATOGRAPHIC BEHAVIOUR OF VARIOUS TYPES OF ORGANIC COMPOUNDS ON PORAPAK R

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Received May 21, 1984; revised January 31st, 1985

Porapak R, a vinyl pyrrolidone copolymer with vinyl benzene, was characterised by gas chromatography for *n*-pentane, *n*-hexane, *n*-heptane, *n*-octane, *n*-nonane, *n*-decane, *cyclo*hexane, benzene, toluene and ethyl benzene at four different temperatures in the range 160–190°. Plots of log V_R vs reciprocal of absolute temperature were linear with correlation coefficients between 0.991 and 0.999.

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MODIFIED X-RAY DIFFRACTION METHOD, INCORPORATING MASS ABSORPTION CORRECTION, FOR THE QUANTITATIVE DETERMINATION OF CALCITE AND DOLOMITE IN SEDIMENTS

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(Received 4 February, 1984; revised 16 January 1985)

A method of X-ray diffraction, incorporating mass absorption, for the quantitative determination of calcite and dolomite (ferroan), using rock powder pellets of the Oxford Clay sediments, presented in this paper, has produced satisfactory results. Ratios of the peak heights for calcite at 29.43^{o}, 2θ, and for dolomite (ferroan), at 30.84^{o}, 2θ, peak positions obtained by X-ray diffraction, corrected for mass absorption and the values of carbon dioxide determined by dividing the total contents of calcite + dolomite; by a factor of 2.2, have been used in this method. The method, presented in this paper has been found fairly rapid and produces accurate and reproducible results.

Biological Sciences Section

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ROLE OF PTERIDINES IN CHAEMOTAXONOMY OF IMMATURES OF TREEHOPPERS (HOMOPTERA: MEMBRACIDAE)+

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(Received July 22, 1984; revised March 11, 1985)

Four different pteridines, viz. xanthopterine, *iso*xanthopterine, biopterin and pterine, were separated through paper chromatography from whole body squash, from squashed body parts, and haemolymph of the immatures of four different species of treehoppers using seven different solvent systems. Whole body squash and squashed body parts of the third instar immatures of all the species gave the most characteristic patterns in *n*-butanol. Rf values were found to be similar to those of pteridines provided by Blakley [1]. Pterine and biopterin were found only in *Oxyrhachis taranda* Fabr. and only the latter in *Oxyrhachis* sp. in addition to xanthopterine and isoxanthopterine in both species and also in *Gargara contraria* Distant but only the former in *G. nigroapica* Funk.

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CONTAMINATION OF FORAGE CROPS WITH LEAD FROM VEHICLE EXHAUST

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(Received November 27, 1984; revised January 24, 1985).

Contamination of fodder crops growing near the highway with lead from vehicle exhaust was determined. Lead contamination in *Pennisetum typhoideum* (65.0-82.0 ppm), *Trifolium alexandrinum* (56.8-76.1 ppm), *Cynodon dectylon* (42.2.60.3 ppm), *Oryza sativa* (52. 1-70.2 ppm) and *Avena sativa* 54.0-72.2 ppm) was maximum in the vicinity of the highway. An inverse relation was found between lead accumulation and distance from the road side.

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SCALE-UP STUDIES OF EXTRACELLULAR POLYSACCHARIDE PRODUCTION BY *XANTHOMONAS CUCURBITAE* IN STIRRED *FERMENTERS**

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(Received January 31, 1984)

Xanthomonas cucurbitae (PCSIR-52) isolated from infected plant leaves, was grown in stirred fermenters of 10, 50, and 100 capacity using sucrose-salt medium by batch process. The fermentation patterns of microbial polysaccharides were greatly improved by the addition of cottonseed meal as "proflo extract", a source of amino acids and other growth factors. The supply of oxygen also plays an important role in such non-Newtonian fermentation process. Partial replacement of air by oxygen or addition of hydrogen peroxide as a source of oxygen concentrate, enhanced the rate of gum fermentation.

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EFFECT OF BROWN RUST ON SUGAR CONTENT OF WHEAT

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(Received November 12, 1984)

Changes in the amount of reducing sugars and total carbohydrates were studied in wheat plants infected by the brown rust fungus, *Puccinia recondita.* Initially, the amount of both reducing sugars and total carbohydrates increased in leaves due to infection, but decreased at the time of the appearance of ears. The maximum difference in sugar content between healthy and infected leaves was approximately of the order of 45%. In the stem of healthy plants the amount of reducing sugars and total carbohydrates were initially higher but at maturity their concentration increased in the infected plants. Accumulation of sugars is discussed in relation to the growth and development of the pathogens in this paper.

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CULTIVATION CONDITIONS AND PHYSICO-CHEMICAL PROPERTIES OF *LUFFA ACUTANGULA* VAR. *ACUTANGULA* SEED OIL

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(Received, September 10, 1984; revised, March 10, 1985)

Luffa acutangula var. *acutangula,* known as ribbed gourd (N.O. Cucurbitaceae), is a cultivated climber and used as a vegetable and medicine for haemorrhoids and leprosy. A study regarding its cultivation conditions and characteristic of the seed oil was made with a view to determining its possibility as an oilseed crop. It has been observed that the amount of oil in the *Luffa acutangula* seeds is 25.8% and the fatty acid composition (amount by weight) of this oil is linoleic (33.56%), oleic (24.42%), palmitic (23.09%), stearic (9.84%), myristic (1.48%), lauric (1.78%) and other unidentified acids (3.32%).

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GENETIC DIVERGENCE FOR MORPHOPHYSIOLOGICAL CHARACTERS IN *VIGNA RADIATA* L. WILCZEK

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(Received September 10, 1984; revised March 3, 1985)

The genetic diversity in 12 indigenous varieties of green gram was studied for 6 characters using D^2 estimates. The study indicated the presence of ample genetic diversity among the cultivars irrespective of their origin. Days to flowering, economic yield and plant height contributed maximally towards genetic divergence.

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INORGANIC ELEMENTS IN FOUR SPECIES OF OYSTERS FROM KARACHI COAST

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(Received November 20, 1984)

The levels of inorganic elements were studied in four species of oysters, namely, *Crassostrea glomerata, C. tuberculata, C. rivularis* and *C. madrasensis,* sampled from Karachi, northern Arabian Sea. The elements studied were calcium, potassium, sodium, magnesium, phosphorus, iron, copper, zinc, manganese and cobalt. The calcium and iron contents were found to be greater in the species occurring at a higher tidal level. The results showed that *C. glomerata* is the least suitable for commercial exploitation as it possesses the lowest dry tissue and highest ash content. Of the four species studied, in *C. rivularis* are concentrated the highest levels of sodium, potassium and phosphorus but the lowest of magnesium and cobalt.

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ASCORBIC ACID AND DEHYDROASCORBIC ACID CONTENTS OF MARINE ALGAL SPECIES FROM KARACHI

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(Received December 2, 1984; revised March 11, 1985)

Ascorbic acid (AA) and dehydroascorbic acid (DHA) contents of 59 species of marine algae belonging to the Chlorophyceae, Florideophyceae and Phaeophyceae collected from Karachi, northern Arabian Sea, showed wide variations between the species studied. The amounts of AA and DHA were on the whole greater in species of brown seaweeds as compared to red and green seaweeds. With few exceptions, DHA was greater than AA. Vitamin C contents were remarkably high in all the species of *Sargassum* (Phaeophyceae) and *Ulva* (Chlorophyceae) tested and these may be utilized for the extraction of vitamin C on commercial scale.