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Physical Sciences Section

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CHLORINATION OF *o*-HYDROXYPROPIOPHENONES

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(Received August 28, 1975)

Abstract. Chlorination of *o*-hydroxypropiophenones gave the expected nuclear chlorinated compounds alongwith trichlorocyclohexa-3,5-dien-1-ones. This lead us to investigate the structural and chemical behaviour of the unusual reaction products. The structures of these compounds have been established from their elemental analyses and spectral data.

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SYNTHESIS OF SUBSTITUTED PYRIDINES

Part VII. Formation of 1,2-Dihydro-6-hydroxy-2-oxo-4-(thiophenyl)-1-substituted-pyridine-3-carboxyanilides

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(Received April 14, 1976)

Abstract. Sodium thiophenoxide in thiophenol reacts with aminopyranooxazines (I) to yield 1-substituted derivatives of 1,2-dihydro-6-hydroxy-2-oxo-4-thiophenylpyridine-3-carboxyanilide (III). Chemical conversions alongwith IR and UV data are provided to support the structural formulation (III) of the new products.

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CHELATING BEHAVIOUR OF SUBSTITUTED 3-ARYLHYDRAZOPENTANE-2,4-DIONE

Part 1. Spectrophotometric Studies of Copper with 3-Benzenehydrazopentane-2,4-dione and *o*-Carboxybenzenehydrazopentane-2,4-dione

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(Received September 9, 1975, revised November 27, 1975)

Abstract. The interaction of 3-benzenehydrazopentane-2, 4-dione (BHP) and *o*-carboxybenzenehydrazopentane-2,4-dione (*o*-CBAP) with $\text{Cu}(\text{H}_2\text{O})^{2+}_4$ was studied spectrophotometrically. The condition of complex formation was determined. It was shown that $\text{Cu}(\text{H}_2\text{O})^{2+}_4$ forms with BHP 1:2 complex (metal ligand), while it forms with *o*-CBAP 1:1 complex. The structures of these complexes are proposed.

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CHELATING BEHAVIOUR OF SUBSTITUTED 3-ARYLHYDRAZOPENTANE-2,4-DIONE

Part II. Spectrophotometric Studies of Copper (II) with *m*- and *p*-Carboxybenzenehydrazopentane-2,4-dione

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(Received December 23, 1975; revised March 18, 1976)

Abstract. The complex formation of copper *m*- and *p*-carboxybenzenehydrazopentane-2,4-dione (*m*, *p*-CBAP) system is treated spectrophotometrically. The composition of the formed complexes are given and the structural configuration of these complexes proposed.

OXIDATION OF SULFENAMIDES

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(Received September 5, 1974; revised November 29, 1975)

Abstract. Oxidation of *p*-nitrobenzenesulfenamide and 2-sulfenamido benzothiazole was carried out with lead tetraacetate and monochloramine. The expected sulfenylnitrene or bis-(sulfenyl)-diimide were not obtained but the only product obtained in excellent yield was the corresponding disulfide. Oxidation of bis(*p*-toluenesulfonyl) hydrazine did not give the corresponding diimide but instead the disulfone was obtained. The oxidation reactions suggested that sulfenyl group (R—S) is a very good leaving group when a nucleophile attacks.

DECAY OF THE TOTAL ENERGY IN MAGNETOHYDRODYNAMICS

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(Received December 1, 1975)

Abstract. The decay of the kinetic and magnetic energies in magnetohydrodynamics is analysed. It is observed that in the case of nonconducting walls and finite conductivity of the fluid the energy of the system decays faster than exponential.

ISOLATION AND IDENTIFICATION OF THE METABOLIC PRODUCTS OF *ASPERGILLUS PULVINUS* KWON AND FENNEL COMPARATIVE STUDIES OF PRODUCTION OF TERREIN AND ERGOSTEROL IN DIFFERENT MEDIA

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(Received August 8, 1975; revised March 20, 1976)

Abstract. *Aspergillus pulvinus* Kwon and Fennel, when grown on semisynthetic medium, produces terrein (I), ergosterol, stearic acid and mannitol. The metabolic products of this mold have not been described previously.

The effect of the change of medium on the yield of metabolites was also noted. Thus it was observed that the Czapek-Dox medium enhanced, the yield of terrein whereas modified Moyer and Coghill medium favoured the production of ergosterol. Terrein has been shown to have antibacterial activity.

SOME STRUCTURAL FEATURES OF THE PECTIC ACID ISOLATED FROM SUNFLOWER HEADS

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(Received October 1975)

Abstract. Oxidation of sunflower pectic acid with nitric acid afforded mucic acid. Oxidation of the pectic acid by periodate showed that the oxidation was complete after the reduction of about 0.9 mole of oxidant per monomer unit. Chromatographic analysis of the periodate-bromine-oxidised pectic acid hydrolysate revealed the presence of D-(—)tartaric acid and oxalic acid, and the absence of galacturonic acid residues. Esterification and reduction of the pectic acid afforded the galactan. Periodate oxidation of the galactan followed by reduction and hydrolysis afforded threitol. The studies demonstrated that the pectic acid of sunflower heads was a linear galacturonan of α -(1 $\rightarrow$ 4)-linked D-galacturonic acid residues.

**DERIVATIVES OF PHLOROACETOPHENONE FROM THE LICHEN PSEUDOVERNIA
FURFURACEAE**

SABOOR AHMAD and GHASIA HUSSAIN

PCSIR Laboratories, Peshawar

(Received December 1, 1975)

Abstract. The isolation of two derivatives of phloroacetophenone has been described. The natural occurrence of one of which is being reported for the second time only and the other is a new compound.

CROWN ETHERS

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Short Communications

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ELECTROLYSIS OF UNDEC-10-ENOIC ACID

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Pakistan J. Sci. Ind. Res., Vol. 19, Nos., 3-4, June—August 1976

**CROSS-KOLBE COUPLING REACTION WITH
UNDEC-10-YNOIC ACID**

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Received

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NITRATION AND THEORETICAL TREATMENT OF AROMATIC REACTIVITY

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(Received October 31, 1975)

Biological Sciences Section

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RESPONSE OF THE RICE VARIETIES TO FIELD APPLICATION OF MICRONUTRIENT FERTILIZERS

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ON THE MECHANISM OF PHOSPHORUS-COPPER INTERACTION IN CORN AND FLOODED RICE ON A CALCAREOUS SOIL

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(Received November 3, 1975; revised February 11, 1976)

Abstract. Application of P to a calcareous soil depressed Cu uptake in corn but enhanced its uptake in submerged rice. Increased Cu uptake in rice occurred by two processes; by enhanced plant growth and by Mn stimulation of Cu absorption by rice roots. Phosphorus had markedly increased Mn concentration in soil percolate. Copper solubility decreased but its depressing effect on Cu contents in plants was overshadowed by relatively a greater Mn and plant growth stimulation of Cu uptake in rice. By contrast to their strong inhibition in upland crops, H, Zn, and Fe had no effect on Cu absorption by lowland rice.

Copper fertilizer did not influence P uptake in either corn or rice plants.

THE FERMENTATIVE PRODUCTION OF OXYTETRACYCLINE BY *STREPTOMYCES RIMOSUS**

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(Received January 24, 1976; revised April 27, 1976)

Abstract. Three strains of *Streptomyces rimosus* were grown on four different media. Medium I was suitable for the production of oxytetracycline by *Streptomyces rimosus* 12907 (Institute For Fermentation, Japan). The carbon and nitrogen sources of medium I were replaced by black strap molasses, fodder yeast (40% total protein) and rice bran. Suitable concentrations of molasses, fodder yeast and rice bran were 30.0, 20.0 and 10.0 g/l respectively. The medium also contained (g/l): KH_2PO_4 0.2 and CaCO_3 1.0. The fermenter (capacity 1200 litre) was aerated by sterile air obtained from a specially designed system, the fermented medium (700 litre) extracted with n-butanol yielded 850.09 crude oxytetracycline.

COMBINED EFFECT OF STARVATION AND RADIATION ON FEEDING ACTIVITY OF RED FLOUR BEETLE, TRIBOLIUM CASTANEUM HBST., (COL., TENEBRIONIDAE)

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(Received March 10, 1975; revised December 6, 1975)

Abstract. Starved and unstarved red flour beetles were irradiated with doses of gamma radiation ranging from 10 to 100 krad and their feeding activity studied in flour labelled with P^{32} . Feeding activity decreased immediately following irradiation. This decrease was not dose-dependant, but the subsequent rate of recovery was dose-dependant. In control beetles, increasing the starvation period proportionally increased their subsequent feeding activity. Starvation before irradiation increased feeding activity, but to a lesser extent than starvation after irradiation.

STUDIES ON THE DEHYDRATION AND REHYDRATION CHARACTERISTICS OF 'BHES' (*NYMPHAEA LOTUS* L)

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(Received October 20, 1975; revised March 31, 1976)

Abstract. Freshly harvested roots of *Nymphaea lotus* L. (Bhes) were prepared by slicing into rings and cuttings into pieces, and dehydrated to 6.5 and 7.8% final moisture contents respectively. The rings showed higher drying rates and better rehydration ratios as compared to the pieces. Sulphur-house treated samples (both rings and pieces) were subjectively rated to be better than the liquid sulphited samples as far as colour of the stored Bhes was concerned. However, sulphur-house sulphiting did not show any favourable effect on flavour of the samples. Though ascorbic acid, sulphur dioxide content and rehydration ratios gradually decreased during 240-day storage of the dehydrated Bhes, yet the product remained acceptable for eight months and rehydrated to almost original size and shape.

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EFFECT OF PEA SIZE AND STORAGE CONDITIONS ON THE QUALITY, DRYING RATE AND REHYDRATION CHARACTERISTICS OF DEHYDRATED PEAS

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(Received March 19, 1975)

Abstract. Both the size and maturity influenced drying rates and rehydration ratios of green peas. Less mature, smaller peas showed higher drying rates than larger or comparatively more mature peas. Although both samples were dehydrated to a similar moisture content, the smaller peas showed more complete rehydration. Both small and large peas immediately after dehydration contained similar levels of SO_2 and showed the same degree of chlorophyll conversion. Peas stored at $100^\circ F$, irrespective of size, showed adverse changes in all quality characteristics, while peas stored at $-10^\circ F$ or at room temperature showed only marginal differences with the exception of chlorophyll conversion. However, results of organoleptic evaluations revealed that as far as colour and flavour of the dehydrated peas were concerned, the peas stored at $-10^\circ F$ were superior to samples stored at ambient temperature or at $100^\circ F$.

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SEXUAL CHARACTERISTICS IN PUPAL AND ADULT STAGES OF *CHILO PARTELLUS* (SWINHÖE)*

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(Received August 7, 1975; revised March 3, 1976)

Abstract. Males and females of *Chilo partellus* (Swinhoe) can easily be separated in pupal and adult stages by locating the genital opening in relation to abdominal segments. In male pupae genital opening is associated with the sternum of ninth abdominal segment and two rounded pads, one on each side of it, are present. In female pupae genital opening occupies the sternum of eighth abdominal segment and the rounded pads are not present. Although less accurate, the two sexes can also be separated by visual observation as the female pupae and moths are comparatively larger and heavier than male pupae and moths.

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SPECIES OF PORTUNID CRABS (DECAPODA, BRACHYURA) FROM KARACHI

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(Received October 31, 1975; revised November 12, 1975)

Abstract. The taxonomy and distribution of fifteen species of Portunid crabs: *Charybdis* (*Charybdis*) *annulata*, *C. (C). callianassa*, *C. (C). feriatus*, *C. (C). hellerii*, *C. (C). lucifera*, *C. (C). natator*, *C. (C). orientalis*, *C. (C). variegata*, *C. (Goniohellenus) hoplites*, *Portunus pelagicus*, *P. sanguinolentus sanguinolentus*, *Scylla serrate*, *Thalamita admete*, *T. crenata* and *T. prymna* has been described.

Short Communications

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UTILIZATION OF N BY WHEAT FROM NH_4
AND NO_3 FORMS APPLIED AS NH_4NO_3
SELECTIVELY LABELLED WITH N^{15}

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COMMUNICATIONS

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**APPEARANCE OF A POTENTIAL PEST OF RICE,
PODOPS LIMOSA WALKER (PENTATOMIDAE:
PODOPINI) THE STINK BUG OF PADDY, IN
THE RICE FIELDS OF SUJAWAL, THATTA
DISTRICT OF LOWER SIND, PAKISTAN***

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**A NEW SPECIES OF AMBLYTHYREUS WEST-
WOOD (HETEROPTERA, REDUVOI DEA,
PHYMATIDAE) FROM PAKISTAN**

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(Received November 3, 1975)

Technology Section

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EFFECT OF VISCOSITY OF ELECTROLYTE USED IN ANODIC DISSOLUTION AND ELECTROCHEMICAL MACHINING

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(Received July 2, 1975, revised March 20, 1976)

Abstract. These investigations are intended to study the effects of increase of viscosity of electrolyte on the various parameters involved in electrochemical machining. Some results obtained under static conditions of sodium chloride solution containing glycerol as viscosity improver have been obtained. Potentiostatic polarization curves obtained suggest that an increase in viscosity of solution resulted in a decrease of limiting current density on nickel. The surface finish of nickel specimens evaluated by Talysurf measurements showed that an improved surface finish is obtained by the use of glycerol in such solutions. The use of viscous solutions in electrochemical machining shall, however, need additional pumping requirements.

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ISOMERIZATION OF α -PINENE TO CAMPHENE USING INDIGENOUS CLAYS AS CATALYST

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(Received January 29, 1975; revised April 4, 1975)

Abstract. China and fire clay samples from the Salt Range, Mianwali, have been investigated for isomerization of α -pinene to camphene. The mode of preparation of the catalyst and its quantity have been varied. China clay treated with sulphuric acid, activated at 350° and 2% by weight of α -pinene, gave the best results. Clays treated with HCl and activated at 550° lose catalytic efficiency.

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EFFECT OF SOME ADDITIVES AND PACKING MATERIALS ON THE SHELF LIFE OF DRUM-DRIED CARROT POWDER

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(Received September 18, 1975; revised March 18, 1976)

Abstract. Effect of addition of BHA, fat and propylene glycol in suitable combinations on the storage life of drum-dried carrot powder as indicated by the β -carotene losses, browning and organoleptic properties was studied. Also polyethylene coated-paper and poly-coated aluminium-foil bags were tested as packing material for the carrot powder as compared with the tin cans. It was found that addition of fat (0.5% fresh wt. basis) plus BHA to the carrot slurry reduced β -carotene losses and enhanced storage life. Addition of BHA plus propylene glycol had no effect on the loss of β -carotene. Polyethylene coated Al-foil as packing material was found as effective as tin cans while polyethylene-coated paper was suitable only for a short period during dry weather.

STUDIES ON THE DIFFERENT PARTS OF THE FLEECE OF HASHTNAGRI SHEEP
Part II. Variation in Diameter and Medullation from Root to Tip End of Wool Fibre

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(Received June 20, 1975; revised January 28, 1976)

Abstract. Variation in fibre and medulla diameter of fully medullated and true fibres of the three segments, i.e. root, middle and tip portions obtained from six distinct parts of Hashtnagri sheep were determined. The C.V. (%) of these portions for the three segments were also calculated. It was observed that fibre and medulla diameter decrease from root to tip-end in the various portions. But in majority of the cases the fibre from the middle part in the back poration shows greater fibre and medulla diameter than those from the root-end. However, there was no change in the fibre diameter of true wool in the three segments. The possible causes of these variation, for example climatic condition and nutrition, were discussed in detail.

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VARIATION IN FIBRE AND MEDULLA DIAMETER OF SUMMER AND WINTER CLIP OF HASHTNAGRI BREED

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(Received August 27, 1975; revised January 28, 1976)

Abstract. Studies on the true and medullated fibres of the autumn and spring shearing clips of Hashtnagri breed were carried out keeping in view the effects of pasture variation, temperature fluctuation and other climatic conditions. The possible influence of these factors on the fibre diameter and medulla variation were discussed. The relationship of fibre diameter with the temperature and nutrition is discussed in detail.

EFFECTS OF SODIUM CHLORIDE ON THE GROWTH AND ION CONTENT OF BARLEY

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(Received September 23, 1975; revised November 1, 1975)

Abstract. The effect of five concentrations of NaCl (0.05, 0.1, 0.3, 0.5 and 1.0%) on the growth of three varieties of barley, Nos. FAO 11941, FAO 11940 and 3329, were studied. High concentration of NaCl depressed seed germination in all the three varieties. Germination was depressed about 56% in No. 3329, 98% in No. 11940, and no seeds germinated in No. 11941. The 2nd and the 3rd leaves in plants in No. 3329 appeared ahead of those in No. 11941 and No. 11940.

Dry weights of tops in all the varieties decreased in high concentration of NaCl such that the dry weights were little different from each other. Dry weights of roots in Nos. 11941 and 3329 decreased at high salt concentration while there was little effect in No. 11940. However, weights of roots in No. 3329 were generally higher than the weights of roots in No. 11941 as well as No. 11940 at all concentrations of NaCl. The concentration of Na and Cl in plant tops in No. 3329 were similar to those in Nos. 11941 and 11940. It is suggested that No. 3329 is somewhat more salt tolerant than Nos. 11941 and 11940.

Short Communications

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DEGRADATION OF CHLOROPHYLL DURING DRYING AND STORAGE OF LEAF PROTEIN CONCENTRATE

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**EFFECT OF HIGH DOSES OF PHOSPHORUS
IN THE PRESENCE OF THREE LEVELS OF
NITROGEN ON THE PHYSICO-CHEMICAL
CHARACTERISTICS OF COTTON LINT**

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