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Physical Sciences Section

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VON BRAUN (BrCN) REACTION ON PROMETHAZINE AND MEBHYDROLINE

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von Braun cyanogen bromide reaction on two antiallergic drugs, promethazine [10-(2-dimethyl amine) *Isopropyl*] phenothiazine) and Mebhydroline (1-benzyl, 5 methyl, 3,4,5,6-tetrahydro γ -carbo-line) is described which has led to their cyano and some unusual derivatives.

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SYNTHESIS OF HETERO – BICYCLIC COMPOUNDS VI. FORMATION OF 1,2-DIHYDRO-4-HYDROXY-6-METHOXY-2-OXO-1-PHENYLPYRIDINE-3 ALKYL CARBOXYAMIDES AND ESTERS

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3-Substituted 2,2-dimethyl-4, 5-dioxo-2,3,5,6-tetrahydropyridine-3(3,4-e) (1-3) oxazines (I) and alkoxide (ethoxide and methoxide) react together to form 1,2-dihydro-4-hydroxy-6-methoxy-2-oxo-1-phenylpyridine-3 alkylcarboxyamides and esters corresponding to the alcohol used. The generality of the reaction has been demonstrated. Structural support to the new products (II, III) were gathered from UV and IR Spectroscopy along with chemical conversions.

SYNTHESIS OF SOME NEW 4-SUBSTITUTED ANTIPYRINES OF ANTICIPATED BIOLOGICAL ACTIVITY

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Schiff's bases of 4-amino-antipyrine were obtained. POCl_3/DMF treatment of base (Id) gave imidine salt which with alkaline solutions gave the imidine base and the aldehyde respectively.

DISTRIBUTION OF ISOMORPHOUS SALTS BETWEEN AQUEOUS AND SOLID PHASES IN FRACTIONAL CRYSTALLIZATION-V

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The theory given in Part I [1] for fractional crystallization has been tested for two systems. One is an alum system, while the second contains two isomorphous picromerite salts. The correlation between the distribution coefficient K and the ratio of the solubilities of the components in each system has been discussed. Finally, the Roozeboom square diagram has been also investigated.

CHELATING BEHAVIOUR OF 3-ARYLPHENYL HYDRAZO PENTANE-2,4 DIONE**Part IX. Spectroscopic and electrometric studies on cobalt (II) complexes of *o,m,p*.-and *o*-sulphonic (4-methyl)phenyl hydrazopentane-2,4-dione**

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Spectroscopic studies in solution and in solid state of the ligands and their complexes with cobalt were carried out. The composition of these complexes is 1:1 and 1:2 metal:ligand as revealed by spectrophotometric and conductometric measurements. The stability constants of these complexes were determined by spectrophotometric and pH-metric methods and compared with those of copper and nickel ions with the same ligands. The solid complexes of cobalt ion with the *p*-derivatives was isolate and the coordination sites were revealed by ir. studies.

STUDY OF THE RATE OF ELECTROLYTIC OXIDATION OF Mn(II) To Mn(III) AND ITS REACTION WITH THIOSULPHATE USING FERROIN AS INDICATOR

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(Received July 7, 1985; revised September 1985)

The rate of electrolytic generation of Mn(III) in sulphuric acid medium and the shelf life of the so prepared solution have been studied. The prepared solution has been successfully used to standardise a method for the determination of thiosulphate potentiometrically, with Mn(III) as self indicator and ferroin as external indicator. The method reported here is convenient, practical, accurate and can be used for routine work also.

Biological Sciences Section

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DEVELOPMENT OF MARINATED FISH PRODUCTS

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Marinated fish products have been produced using locally available fish species by means of a two-stage curing process at 4°. The first stage consists of a period of 8 weeks in pickle containing 4% acetic acid and 10% salt. This was followed by 2 weeks in a weaker pickle containing 1% acetic acid and 2% salt. The finished products could be stored satisfactorily at 4° for 16 weeks. Sensory chemical and microbiological changes that take place during processing were also determined. It was concluded that satisfactory cold marinated fish products can be prepared from *Stramateus* spp. (white pomfret) followed by *Lutjanus* spp. (red snapper), *Pristipoma* spp. (sea bream) and *Cynoglossus* spp. (sole). *Pelamys* spp. and *Cybiium* spp. (mackerel) were found unsuitable for this purpose.

THE CORRECT SCIENTIFIC NAME OF "DUDHI"

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"Dudhi" is an indigenous drug which is used in the diseases of children e.g. worms, bowel complaints, cough, dysentery and colic. In the last two diseases the juice of the plant is given. Decoction of plant is given in bronchial affections and asthma. The latex of the plant is used as application for warts [1, 2]. It has been recommended for hay fever and whooping cough [3]. The drug, which is used for cure of many diseases in the indigenous system of medicine, has unfortunately not been standardized. Two botanical names, *Euphorbia hirta* L. and *Euphorbia hypericifolia* Hk.f, are referred to in the literature under one Unani name "Dudhi" [4, 7]. In order to determine the correct scientific name of the Unani drug "Dudhi" comparative pharmacognostic studies have been taken up. These studies revealed that the correct botanical name of unani drug "Dudhi" is *Euphorbia hirta* L.

PHYTIC ACID AND POTENTIAL NUTRIENTS IN WHEAT CORN AND SOYBEAN

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(Received June 19, 1984)

Different cultivars of wheat, corn and soybean were assayed for phytic acid, phytate phosphorus, and potential nutrients such as protein, fat, ash, fibre and total energy as well as selected mineral elements like iron and phosphorus. The data revealed that soybean contained significantly higher amounts of all nutrients as compared to corn and wheat. Significant difference in the nutrient contents was also observed among the cultivars of each crop. The concentration of phytic acid ranged between 0.9 and 1.2% in wheat, 0.7 to 0.9% in corn and 1.3 to 1.5% in soybean. The average value for the phytate phosphorus was the highest in soybean (429.6 mg) followed by wheat with (217.5 mg) and lowest in corn (197.2 mg) per 100 g.

CHROMATOGRAPHIC SEPARATION AND PHYSICO-CHEMICAL STUDY OF LEGUMIN FROM CHICKPEA (*CICER ARIETINUM* L.)

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(Received, March 3, 1983; revised May 5, 1985)

Total salt-soluble protein, extracted from chickpea cotyledon, was precipitated with ammonium sulphate into fractions 0.60 and 60-100%. Albumin was removed from fraction 60-100 by dialysis at 3-5° against H₂O, pH 4.1 and the globulin of fraction 60-100 was subjected to chromatographic isolation of legumin in homogeneous state. The physico-chemical properties of isolated legumin were studied by gradient extraction on celite column, chromatography on hydroxylapatite and DEAE-cellulose columns, gel electrophoresis, and ultracentrifugation. The chromato-electrophoretic behaviour and sedimentation curve showed its elution constants at 76% ammonium sulphate concentration, 0.26 μ NaCl and 0.40 M phosphate buffer on celite, DEAE-cellulose and hydroxylapatite columns respectively. The sedimentation coefficient was 11.72.S. Legumin was rich in arginine and tyrosin and poor in histidine and threonine.

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SCREENING THE EFFECTIVENESS OF GRANULAR AND FOLIAR INSECTICIDES AGAINST CORN STALK BORER, *CHILO PARTELLUS* (SWINHOE)

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Received April 5, 1984; revised, August 4, 1985

Whorl application of carbofuran G (1.40 kg a.i./ha), diazinon G (1.40 kg), endrin G (0.56 kg), fenthion G (1.12 kg) and trichlorfon G (0.70 kg) 18 and 37 days after sowing revealed erratic and inconclusive results against the corn stalk borer, *Chilo partellus* (Swinhoe). Phytotoxicity was noted in the carbaryl treated plots. Spray application of bromophos (.038%) isobenzan (0.023%), 24 and 40 days post-sowing, were the best in reducing and checking the infestation levels. These were followed by bromophos-ethyl (0.06%), isoprocarb (0.10%), and fenitrothion (0.10%). Phenthoate (0.05%) was fairly effective. Stubble infestation levels were comparable in the treated and untreated plots.

RELATIVE EFFICACY OF ETHIOFENCARB G IN DIFFERENT CONDITIONS OF BEAN APHID INFESTATION ON BROADBEAN

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In sandy soil where both aphids and plant density were maximum the minimum effective level of ethiofencarb G was 2 Kg a.i./ha against *Aphis fabae* Scopoli but the residual effect was much shorter. The uptake was more pronounced in older (27-week-old) than younger (3-week-old) plants. In the field simulating conditons, where both plant and aphid's density was minimum and the plants were in seedling stage, the lower level (2 kg) was equally effective as the 3 and 4 Kg a.i./ha and remained persistent for over a month. In 1:1 mixture of sand and peat moss the 2 and 3 kg rates, applied 3 days after germination, were not effective while 4 kg demonstrated a more persistent effect (over seven weeks). Ethiofencarb G was not effective against otherpests feeding on bean plants.

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**EXPERIMENTAL INGESTION OF *DACUS ZONATUS* SAUNDERS (DIPTERA: TEPHERITIDAE)
AS A POSSIBLE CAUSE OF HUMAN PSEUDOMYIASIS IN PAKISTAN**

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(Received June 21, 1983; revised June 17, 1985)

In Pakistan during June 1983, the possibility of enteric myiasis in man by the larvae of *Dacus zonatus* Saunders was tested experimentally. Human volunteers ranging in age from 25 to 38 years ingested 25 *D. zonatus* maggots and their stool were collected and examined.

The results of these tests indicate that the larvae of *Dacus zonatus* did not survive passage through the human alimentary tract, and this species cannot cause enteric myiasis in man.

THE INFLUENCE OF HYDROXYUREA ON THE INDUCTION OF APOGAMY IN *PTERIDIUM AQUILINUM* L.

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(Received April 30, 1985, revised July 14, 1985)

Treatment with sublethal doses of hydroxyurea inhibited the growth of young normal sporophytes of *Pteridium aquilinum* L. and favoured the formation of apogamous sporophytes on reversal to the medium lacking the drug. The addition of sucrose during the developmental phase of the induced sporophytes seemed to be beneficial as it increased the response. Apogamous sporophytes failed to develop on a medium containing ABA during the period of induction. However, its presence during developmental phase permitted their formation but the number was less than the control.

Technology Section

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ROLE OF R & D ORGANIZATION IN TECHNOLOGY DEVELOPMENT & TRANSFER*

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The role of R & D in the technological development and the major issues of project selection and commercialization of R & D results are discussed in detail. The annual turnover of PCSIR processes in commercial production from 1969 to 1985 is found to show an average increase of 11% p.a. in the total turnover. This compares with the corresponding increase in budget of PCSIR.

STUDIES ON MOHMAND AGENCY SILICA SAND

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Geochemical and beneficiation studies were carried out on representative samples of silica sand from Mohmand Agency, NWFP, to examine their suitability for glass industry. The samples were subjected to physical and chemical treatments to remove iron bearing minerals and other impurities.

Final results indicate that the quantity of iron is too high for the manufacture of quality glassware. After beneficiation with sulphite process the iron content in raw samples was reduced by a percentage 72.63 to 90.43.

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A METHOD FOR THE ESTIMATION OF ASCORBIC ACID FROM PRESERVED FRUIT JUICES AND SQUASHES

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(Received May 27, 1985)

A titrimetric method based on the use of potassium ferricyanide for the estimation of ascorbic acid in fruit juices and squashes containing metabisulphite or sodium benzoate as preservative has been described.