

Physical Sciences Section

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

STUDIES ON COORDINATION COMPOUNDS

Part VII. Phthalhydrazide Complexes of Cobalt(II)

M. ARSHAD A. BEG and S. ASHFAQUE HUSSAIN

PCSIR Laboratories, Karachi 39

(Received August 23, 1972)

Abstract. Phthalhydrazide complexes of cobalt(II) have been prepared with metal-ligand ratio of 1:2 and 1:1. The spectra and solubility of the two compounds are different. The conditions of preparation and the spectra suggest that they are formed as inner complex salts through enolization of the carbonyl and have structure I and II.

The complex I is obtained as the diaquo compound and has been reacted with ethylenediamine, dipyridyl, acetylacetone, *o,m*, and *p*-phenylenediamine. While ethylenediamine and dipyridyl replace the two water molecules, there is a replacement of the ligand by acetylacetone and the phenylenediamines. Also on reacting the acetylacetonate and ethylenediamine complexes a replacement series phthalhydrazide $>Cl^->acac>en>bipy>H_2O>$ phenylenediamines is obtained.

Conductivity measurements suggest that the complexes are neutral. The IR bands at 565 and 425 cm^{-1} are assigned to asymmetric and symmetric M—O stretching frequencies. The IR and UV spectra are consistent with an inner complex salt formation. The magnetic moment corresponds with an octahedral complex for both I and II. The higher moment for II does not suggest any metal-metal interaction.

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

PI-ELECTRON SPIN DENSITY CALCULATION ON ALLYL RADICAL

SAEEDAN BEGUM and MAHBOOB MOHAMMAD

Institute of Chemistry, University of Islamabad, Islamabad, Pakistan

(Received September 15, 1972; revised October 30, 1972)

Abstract. An attempt is made to remedy the overcompensation of spin contamination, inherent in Amos and Snyder method of unrestricted Hartree-Fock LCAO MO SCF. This may be done by using the charge and bond order matrices (J and K) obtained after annihilation, in the unrestricted molecular orbital equations, and calculating spin densities from P and Q matrices obtained from these eigenvalue equations. A calculation on allyl radical showed that the first iteration before annihilation gives almost exactly the same result as obtained by Sando and Harriman by their optimization method.

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

SYNTHETIC STUDIES OF BIFLAVONOIDS

Part II

S. AHMAD and S. RAZAQ

PCSIR Laboratories, Peshawar

(Received July 26, 1972)

Abstract. 8-Iodo-5,7,4'-trimethoxyflavone and 6-iodo-5,7,4'-trimethoxyflavone have been synthesised by direct iodination of the flavone molecule and their structures have also been established by NMR spectra and analysis. The 8-iodo isomer is an important intermediate in the synthesis of natural biflavones^{1,2} which has been obtained by a convenient method and in better yield.

Short Communications

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

A NOVEL PHOTOCATALYSED BENZYLIC REARRANGEMENT Part I

M. AFZAL

Department of Chemistry, University of Mosul, Iraq

(Received May 27, 1972; resvied October 14, 1972)

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

**THE STRUCTURE OF AN ARABINO GALACTAN
FROM COLOCASIA ESCULENTA (TARO)**

M. ABDEL-AKHER, A.M. YOUSSEF and S.M. HEGAZI

National Research Centre, Cairo, A.R. Egypt

(Received September 13, 1971; revised October 26, 1972)

Biological Sciences Section

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

THE BIOCHEMORPHOLOGY OF CYCLOBUTANECARBOXAMIDES

KARIMULLAH A. ZIRVI*

PCSIR Laboratories, Peshawar

CHARLES H. JARBOE

*Department of Pharmacology, School of Medicine, University of Louisville, Louisville,
Kentucky 40202, U.S.A.*

(Received April 5, 1972; revised August 18, 1972)

Abstract. Several *N*-alkylcyclobutanecarboxamides have been synthesized and examined for general central nervous system depressant properties, barbiturate potentiation, myorelaxant, antitremorine and anticonvulsant potency. Water solubility seems to play a major role in the activity of these compounds. *N*-4-Chlorophenylcyclobutanecarboxamide appears to be the most active myorelaxant while *N*-cyclopentyl- and *N*-furfurylcyclobutanecarboxamides appear to be most active as anti-Parkinson agents. None of the compounds is active against pentylenetetrazole-induced convulsions.

FORAMINIFERAL FAUNA OF KORARA SHALE**SYED HASAN KHURSHEED***Oil and Gas Development Corporation, Central Hotel Building, Club Road, Karachi 4*

(Received September 30, 1972)

Abstract. Korara Shale has been included in 'Jakkher Group' by Colombo Plan Geologists and the type locality had been designated at Jakkher Lak. Microfaunal investigations of these shales have been carried out on samples collected at Goth Allah Baksh. These investigations reveal that Korara Shale ranges from Upper Cretaceous (Maestrichtian) to Paleocene (Montian). Evidence is at hand that this formation elsewhere extends into Eocene.

MEGASPOROGENESIS AND THE DEVELOPMENT OF EMBRYO SAC IN INDIGOFERA OBLONGIFOLIA

(Miss) PARVEEN AZIZ, NASIR R. KHAN and N. IFTIKHAR

PCSIR Laboratories, Karachi 39

(Received August 2, 1972)

Abstract. The investigations on megasporogenesis and megagametogenesis of *Indigofera oblongifolia* Forsk have revealed that the archesporium originates from a single subhypodermal cell and directly functions as megasporocyte. After reduction division, the megasporocyte forms a linear tetrad of four megaspores, however, triad formation is more frequent than the tetrads. The chalazal megaspore is functional while the the rest degenerate. The mature embryo sac is of the polygonum type.

After the differentiation of archesporial cell, the integuments initiate exogenously as annular rings. The inner integument remains two-cells thick, where as the outer one gradually becomes 4-6 cells thick especially near the micropylar end. In the course of embryo sac development most of the nucellar cells are being assimilated and the embryo sac at its maturity is circumscribed only by double layer of nucellus cells.

DIFFERENTIAL THERMAL ANALYSIS OF SOME HUMAN STONES

AINUL H. KHAN,* M.A. QAISER and KHURSHID JEHAN*

PCSIR Laboratories, Peshawar

M. KABIR

Department of Surgery, Khyber Medical College, Peshawar

(Received January 15, 1972; revised August 8, 1972)

Abstract. Human stone disease is common in Asiatic countries. Differential thermal analysis of the stones provides a cheap, accurate and simple method of characterization. The DTA curve of whewellite, weddellite, struvite, newberyite, uric acid and cholesetrol stones have been reported.

CORRELATING EARLY WAX SECRETION BY THE LAC INSECT WITH ITS BODY SEGMENTS

S. MAHDIHASSAN

SD-34 Block A, North Nazimabad, Karachi 33

(Received August 23, 1972)

Abstract. The first stage lac larva produces dorsally a shield of hard wax divisible into 11 plates. From the sides ribbons of hard wax fibres are secreted. Body segment No. 2, has the largest plate of wax and from its sides two ribbons are produced on each side, not one as has been previously stated. Each of these ribbons lies on either side of the major spiracle. Ventrally the precursor of vaginal opening lies between the body segments 7 and 8.

Short Communications

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6. December 1972

A PROBABLE SOURCE OF CYTOCHROME OF BACTERIAL ORIGIN

S. MAHDIHASSAN

SD-34 Block A, North Nazimabad, Karachi 33

(Received January 18, 1973)

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

**SOME PRELIMINARY REMARKS ON
ZYGINIDIA QUYUMI (AHMED), AN
IMPORTANT PEST OF WHEAT AND MAIZE
IN SOME PARTS OF PAKISTAN**

MANZOOR AHMED and ABDUL JABBAR

Bioecology Research Project, Department of
Zoology, University of Karachi, Karachi 32*

(Received September 7, 1972; revised January 13, 1973)

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

EFFECT OF GAMMA COBALT (γ Co⁶⁰) RADIATION ON THE GROWTH AND ALKALOIDAL CONTENTS OF MEDICINAL PLANTS

Part I. *Hyoscyamus niger* L. (Solanaceae)

(Mrs.) SADDIQA MALIK, MAHMOOD AKRAM,
SHAFIQ-UR-REHMAN and N.A. MALIK,

PCSIR Laboratories, Peshawar

(Received May, 24, 1972; revised August 7, 1972)

Hyoscyamus niger L. 'henbane' (khurasani aivavan)

Technology Section

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

THE EFFECT OF TEPA ON THE REPRODUCTIVE POTENTIAL OF THE RED FLOUR BEETLE, TRIBOLIUM CASTANEUM

MUHAMMAD MUNIR MALIK* and DAVID JOHN GALLEY

Imperial College Field Station, Ashurst Lodge, Ascot, Berks

(Received August 12, 1972)

Abstract. Tepa when applied by a tarsal contact method, failed to produce complete sterility in *T. castaneum* without toxic effects. The females were more tolerant of the sterilizing and toxic effects of Tepa than the males. Males exposed to 20 $\mu\text{g}/\text{cm}^2$ treatment of Tepa were completely sterile but 79% of treated males died within 2 weeks after treatment. However, this dose did not produce complete sterility in females. The males exposed to 10 $\mu\text{g}/\text{cm}^2$ treatment of Tepa were completely sterile for 1 week after treatment, after which they recovered a transitory fertility. The Tepa-treated males failed to elicit the full oviposition potential of the females.

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

GAS CHROMATOGRAPHIC DETERMINATION OF ORGANOPHOSPHORUS PESTICIDES IN FORMULATIONS

ZAFAR MASUD and ASLAM I. NASIM

Toxicology and Pesticides Laboratory, Department of Plant Protection, Karachi 27

(Received March 24, 1972; revised August 18, 1972)

Abstract. A gas chromatographic method using electron capture detector is described for the determination of six organophosphorus pesticides in formulations. 5% QF-1 on 60-80 mesh phase Sep-W was used as the GLC column material. The method is rapid, simple and sensitive down to 0.01 μg .

EFFECT OF ULTRASONICS ON THE VISCOSITY OF LONG-CHAIN POLYMER SOLUTION**Part I. 250 Parts Polyoxyethylene Per Million Parts of Water**

MD. AMINUZZAMAN, MARGHOOB AHMAD KHAN and M. GAZIM UDDIN

PCSIR Laboratories, Karachi 39

(Received June 1, 1972; revised August 10, 1972)

Abstract. The effect of ultrasonic waves (2 MHz, $\sim 5\text{W}/\text{cm}^2$) on the viscosity of 250 p.p.m. solution of long-chain polyoxyethylene (mol.wt. $\approx 4,000,000$) has been investigated in order to estimate the degree of depolymerization, the approximate relations obtained are:

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

SILVER-COPPER-CADMIUM ELECTRICAL CONTACT ALLOY

M.I. BHATTI and KHALID MASOOD

PCSIR Laboratories, Lahore 16

(Received June 20, 1973)

Abstract. An attempt has been made to obtain uniformly distributed microscopic particles of about 10% copper and 2% cadmium in the matrix of silver under controlled conditions of pouring and casting. A study of the alloy formed from Ag-Cu; Ag-Cu-Cd; Ag-Cu-Ni and Ag-Cu-Ni-Cd was made for their contact properties. Effect of addition of Cd and Ni has been studied.

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

PREPARATION OF LOW VISCOSITY CELLULOSE NITRATE

MUHAMMAD ELIAS DUBASH, QAMAR AHMAD QURESHI and SAJID HUSSAIN NAQVI

Government Industrial Research Laboratories, Lahore

(Received February 2, 1972; revised July 1, 1972)

Abstract. Low viscosity cellulose nitrate is generally prepared by carrying out degradation of nitrated cellulose with steam under high pressure. In the present investigation this hazardous step was avoided by first degrading cellulose with hydrochloric acid under controlled conditions and then nitrating it. Cellulose nitrate prepared in this way was comparable with the imported material.

THE FATTY ACIDS OF INDIGENOUS RESOURCES FOR POSSIBLE INDUSTRIAL APPLICATIONS

Part IV. Investigations of the Species of Salvadoraceae Family

S.A. KHAN, M.I. QURESHI and M.K. BHATTY

PCSIR Laboratories, Lahore 16

(Received August 7, 1972; revised October 6, 1972)

Abstract. The seed fats from *Salvadora oleoides* and *Salvadora persica* (N.O. *Salvadoraceae*) have been analysed for their fatty acid composition. They have been shown to be a rich source of both myristic and lauric acids and thus a good substitute of coconut oil for the soap industry in Pakistan.

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

A STUDY OF PHYSICAL PROPERTIES OF INDIGENOUS SISAL FIBRES UNDER VARIOUS CONDITIONS

M.A. CHAUDRI and NISAR A. JAMIL

PCSIR Laboratories, Peshawar

DOST M. SANDILA and MOHAMMAD SHAMIM

Pakistan Institute of Cotton Research and Technology, Karachi

(Received March 14, 1972; revised July 26, 1972)

Abstract. Breaking strength and percentage elongation of indigenous sisal fibres were determined after soaking them in distilled water, decinormal solutions of hydrochloric acid and sodium hydroxide and sea-water for a minimum period of 24 hr. The strength is significantly dependent on linear density and percentage elongation. The soaking appears to reduce the breaking load and the stress-at-break considerably but there appears to be no significant difference between the various treatments.

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

REGAIN CHARACTERISTICS OF PAKISTANI SILK

GHULAM NABI, A.H. MOHSIN and S.M.A. SHAH

PCSIR Laboratories, Peshawar

(Received April 15, 1972; revised August 12, 1972)

Abstract. Adsorption and desorption measurements have been made on white and yellow Pakistani silk both in the gum and the degummed form. Use of common laboratory facilities for the purpose has been discussed and suggestions for the official regain have been considered.

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

PRODUCTION OF PROTEINS BY AZOTOBACTER CHROOCOCCUM

M.A. EL-SYED, A.H. EL-REFAI and T.A. MOHAMED

Microbiological Chemistry Research Laboratory, National Research Centre, Dokki, Cairo, A.R. Egypt

(Received September 18, 1972; revised June 19, 1972)

Abstract. Cultivation of a locally isolated nitrogen fixer strain of *Azotobacter chroococcum* in laboratory fermentor was successfully achieved. Composition of the medium and methods of fermentation were recorded. The growth, as well as the nitrogen and lipid of the cultures were greatly affected by aeration as well as the carbohydrate level of the fermentation medium. The chemical composition of the cell proteins revealed the presence of sixteen different amino acids.

CERAMIC COLOURS**Part V. Brown Stains**

M. AYUB, FAZALUR REHMAN, M.A. BEG and F.A. FARUQI

PCSIR Laboratories, Lahore 16

(Received November 6, 1971; revised July 29, 1972)

Abstract. Ten families of the brown stains are discussed: (i) chrome-iron, (ii) chrome-iron-zinc, (iii) chrome-iron-alumina, (iv) chrome-iron-lime, (v) chrome-iron-manganese, (vi) iron-zinc-manganese, (vii) iron-chrome-tin, (viii) chrome-manganese, (ix) manganese-alumina, and (x) iron-chromium-zinc with the addition of alumina or tin. Typical glazes were used as base for each stain. Optimum composition of the stains, conditions such as calcination temperature, grinding, composition of the base glazes and that of the flux used for underglaze and onglaze are investigated. Maturing temperature in the range of cone 02-10 were employed. Brown ceramic stain generally changes its shade when used as inglaze. Stability of brown stain with the incorporation of Al_2O_3 , SnO_2 zircon and Sb_2O_3 into the calcined chrome-iron-zinc brown stain, mostly used in the industry, have been investigated.

Short Communications

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

FIELD TRIALS OF PETKOLIN GRANULES AGAINST BLACK CUTWORM (LEPIDOPTERA: NOCTUIDAE) OF POTATO AT MALIR, KARACHI

S.H. ASHRAFI, A.H. QURAISHI and AIJAZ ALI

PCSIR Laboratories, Karachi 39

(Received December 20, 1972)

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

**COMPARISON OF FELLMONGERED AND
SHORN WOOL WITH SPECIAL REFERENCE
TO IMPROVEMENT IN DYEING**

TAUFEEQ KHAN, AMIR MOHD KHAN and
MUMTAZ AHMAD KHAN

PCSIR Laboratories, Peshawar

(Received April 8, 1972; revised September 28, 1972)

Pakistan J. Sci. Ind. Res., Vol. 15, No. 6, December 1972

REMOVAL OF IRON FROM NICKEL CHLORIDE

M. AKBAR SHEIKH

*Kohinoor Rayon Limited and United Chemicals,
Kala Shah Kaku, Punjab*

(Received June 13, 1972)