ISSN 0030-9885
Coden: PSIRAA 38 (7) 233-282 (1995)

PAKISTAN JOURNAL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Vol. 38, No. 7, July 1995

Physical Sciences. Pages 233-252

Biological Sciences. Pages 253-266

Technology. Pages 267-276

Short Communications. Pages 277-282

Published monthly by

Scientific Information Centre
PAKISTAN COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH
KARACHI

Physical Sciences Section

Pak. j. sci. ind. res., vol. 38, no. 7, July 1995

SYNTHESIS, CHARACTERIZATION AND ANTIBACTERIAL ACTIVITY OF SOME TRANSITION METAL COMPLEXES WITH THIOUREA DERIVATIVES

M. Quamrul Islam, A.B.M. Mizanur Rahman Ansary and M. Umar Ali
Department of Chemistry, University of Rajshahi, Rajshahi 6205, Bangladesh

(Received October 2, 1994 ; revised February 28, 1995)

Transition metal complexes of Mn(II), Co(II) and Ni(II) ions with 2-hydroxyphenylthiourea, 2-carboxyphenylthiourea and 4-methyl-phenylthiourea have been synthesized and characterized on the basis of elemental analyses, conductivity and magnetic measurements and from their IR spectral studies. The complexes have the general formula: $K_2[M_2(L^{2-})_2(NO_3)_2]$, L^{2-} = Dinegative deprotonated form of the ligand, 2-hydroxyphenylthiourea; $[M(L)_2NO_3]$, where L = 4-methylphenylthiourea and $[M_2(L^-)_2(NO_3)_2]$, where L^- = Uni-negative deprotonated form of the ligand, 2-carboxyphenylthiourea, with 2-hydroxyphenylthiourea and 2-carboxyphenylthiourea, Mn(II), Co(II) and Ni(II) metal ions form 5-coordinate bridging complexes whereas 4-methylphenylthiourea gives rise to 4-coordinated complexes with the same metal ions. The antibacterial activity of the ligands and their complexes have been tested with *Bacillus subtilis*. Some complexes show higher activity then that of the free ligand value whereas in some cases the activity decreases. Some complexes were found to retain the same activity as that of the ligand.

Key words: Metal complexes, Thiourea ligands, Antibacterial activity.

Pak. j. sci. ind. res., vol. 38, no. 7, July 1995

SYNTHESIS OF NEW CYCLIC PYRAZOLONESULFONYL THIOANALOGES OF POSSIBLE PHARMACOLOGICAL ACTIVITY

MOHAMMAD S.I. MAKKI AND HASSAN M. FAIDALLAH
Department of Chemistry, Faculty of Science, University of King Abdulaziz, Saudi Arabia

(Received July 24, 1994 ; revised March 15, 1995)

Condensation of benzenesulphonylthiourea derivatives **1** with halogeno esters in absolute ethanol afforded the corresponding iminoesters **2-4**, while in glacial acetic acid they yielded the thiazolidinone and the thiazinone derivatives **6** and **7**. Reaction of **4** with arylhydrazines afforded the thiadiazines **5**. Cyclization of **1** with α-bromoacetophenones yielded the thiazolines **8**.

Key words: Pyrazolonebenzene sulphonylurea, Thiazinone, Thiadiazine.

Pak. j. sci. ind. res., vol. 38, no. 7, July 1995

DEVELOPMENT OF BIMETAL TEST SPECIMEN FOR TESTING MATERIALS AT HIGH HOMOLOGOUS TEMPERATURE

MOHAMMAD JAVED HYDER AND DAVID A. WOODFORD
Mechanical Engineering Department, Rensselaer Polytechnic Institute, Troy, New York 12180-3590, USA

(Received October 2, 1993; revised March 27, 1995)

A bimetal test specimen has been developed to be used for testing materials at high homologous temperatures. The testing material selected is 50/50 lead-tin solder. At room temperature its homologous temperature is 0.6. Specimen manufacturing method adopted is simple and economical. OFHC copper has been used as a rigid support to install extensometer for strain measurements and to hold the specimen by the testing machine grips. Copper has been used because it provides a strong bond with solder and it is easy to manufacture copper to the required shape and size. The strain produced in the copper is 123 times less than that produced in solder. Formula has been developed to calculate the strain produced in the gage section using the strain value measured using extensometer installed on copper.

Kew words: Test specimen, Fatigue, Creep.

Pak. j. sci. ind. res., vol. 38, no. 7, July 1995

SYNTHESIS AND BIOLOGICAL ACTIVITY OF SOME NEW BENZOTHIAZOLE DERIVATIVES

Y. A. ABBAS

Chemistry Department, Faculty of Education, Tanta University, Kafr El-Sheikh, Egypt

(Received Novermber 11, 1993 ; revised April 12, 1995).

Synthesis of some new 2-(N-Tos-or N-Phtaminoacyl or N-Tos- or N-Pht-dipeptidyl) amino-4-nitro-(or-4-methyl) benzothiazole derivatives has been described (II- XXIX). Some of the synthesized derivatives have been found to possess antimicrobial properties against a number of microorganisms.

Keywords: 2-amino-4-nitrobenzothiazole, 2-amino-4-methylbenzothiazole, Tosyl and phthalyl of some amino acids.

Pak. j. sci. ind. res., vol. 38, no. 7, July 1995

COBALT (II) AND NICKEL (II) COMPLEXES WITH SCHIFF BASE LIGANDS 1,2-DIPHENYL-2-ALKYLIMINOETHAN-1-ONE OXIME

H.C. Rai, Ramesh Kumar, Shashikala and N.N. Sharma
Department of Chemistry, L.S. College, Muzaffarpur-842001, Bihar, India

(Received June 6, 1991; revised May 21, 1995)

A number of complexes of the type $[M(HL^{1-4})_2X_2]$ where M=Ni(II), Co(II); HL^{1-4}=Schiff base ligands derived by the condensation of 1,2-diphenyl-1-hydroxyiminoethan-2-one with n-butylamine (HL^1), isobutylamine (HL^2), n-propylamine (HL^3) and isopropylamine (HL^4); X = Cl^-, Br^-, I^-, NO^-_3 and ClO^-_4 have been synthesized and characterised on the basis of elemental analysis, magnetic susceptibility, conductivity, infrared and electronic spectral data.

Key words: Metal complexes with imine-oxime ligands.

Biological Sciences Section

Pak. j. sci. ind. res., vol. 38, no. 7, July 1995

RESIDUAL EFFECT OF STOMP 330E (PENDIMETHALIN) ON THE SUCCEEDING CROPS

M. S. ZAKI, S. M SHAH, AND D.B. MUHAMMAD
Central Cotton Research Institute, Multan-60500, Pakistan

(Received April 11, 1992; revised March 14, 1995)

The field investigations were carried out for three consecutive years from 1984-85 to 1986-87 at the Agronomic Research Area, Central Cotton Research Institute, Multan to see the residual effect of Stomp 330 (Pendimethalin) [N-(1-ethylpropyl)-3, 4-dimethyl-2, 6-dinitrobenzenamine] at 1.2 Kg/ha on different crops following its treated and untreated plots in cotton. From three years average it was concluded that there were no significant differences between Stomp 330E treated and untreated plots of the succeeding crops. However, Stomp 330E treated plots gave higher number of seedlings/m^2, plant height and grain yields Kg/ha than untreated plots. Thus the use of Stomp 330E for weed control in cotton was safe and had no residual effects on the succeeding crops viz. wheat, maize, sunflower, soybean and mung.

Key words: Stomp 330E carryover, Succeeding crops, Grain yields, Seedlings, Plant height.

Pak. j. sci. ind. res. vol. 38, no. 7, July 1995

ANALYSIS OF ACIDIC METABOLITES OF BIOGENIC AMINES IN THE NERVOUS TISSUES OF THE *PERIPLANETA AMERICANA* BY GAS CHROMATOGRAPHY/NEGATIVE ION CHEMICAL IONISATION-MASS SPECTROMETRY. (GC/NICI-MS)

NUSRAT SHAFI AND J.M. MIDGLEY*

PCSIR Laboratories, P.O. Peshawar University, Jamrud Road, Peshawar.

(Received October 24, 1992; revised March 19, 1995)

Acidic metabolites of biogenic amines in the brain tissues of *Periplaneta americana* have been identified and quantified by the extraction-derivatisation method. This involves differential acetylation of alcoholic groups in the presence of phenolic hydroxyls, using pentafluorobenzyl bromide. The method establishes unambiguously the presence of *p*-hydroxybenzoic acid, 3,4-dihydroxyphenyl acetic acid, *p*-hydroxymandelic acid and 3,4-dihydroxymandelic acid in the brains of individual insects in sub-nanogram concentrations. This has been confirmed by the novel extraction-derivatisation method using dichlorotetrafluoro acetone.

Key words:Mono-amine oxidative de-amination, Acidic metabolites, Biogenic amines.

Pak. j. sci. ind. res., vol. 38, no. 7, July 1995

STUDIES ON THE EFFECT OF REDUCTION OF FIBRE AND ANTINUTRITIVE FACTOR ON THE QUALITY OF SUNFLOWER MEAL

M. YASIN, WAZIR H. SHAH, ZIA-UR-REHMAN AND S. ALI
PCSIR Laboratories Complex, Roomi Road, Lahore-54600, Pakistan

(Received October 17, 1994; revised April 3, 1995)

Three varieties (suncross-843, NK-265, NK-212) of sunflower seeds were analysed for their proximate composition. Cultivar NK-212 was selected for further treatments, in view of its desirable nutritive and other physicochemical characteristics. Application of different methods/treatments resulted in reduction of fibre from 24.41 to 18.34% and chlorogenic acid from 3.34 to 1.02%. Biological evaluation studies on the processed meal indicated considerable improvements in the nutritional qualities.

Key words: Fibre content, Chlorogenic acid, Nutritional quality, Sunflower.

Pak. j. sci. ind. res., vol. 38, no. 7, July 1995

INDUCED HISTOLOGICAL CHANGES IN *PISTACIA VERA* L. COTYLEDONARY TISSUE

SHAISTA JABEEN, NASREEN ZAIDI, FERHA ZAFAR, MUHAMMAD ZAFAR IQBAL*, AND F.H.SHAH
PCSIR Laboratories Complex, Lahore-54600, Pakistan.

(Received December 12, 1993 ; revised April 3, 1995)

Pistacia vera cotyledonary explants cultured on MS-Murashige and Skoog medium; WP-Woody plant medium; EK-Eriksson medium and SH-Schenk and Hildebrandt medium formed calli of different quantity and quality. Percentage gain in callus mass was maximum on WP medium, relatively double in amount as compared to the rest of the mediums, MS, EK or SH. Calli were white to dark brown in colour and nodular/friable in texture. Active growth of the calli ended in browning of the tissue which led to slow growing new white soft calli. Browning tendency of the cultures was same in case of slow or rapidly growing ones. Effect of replacing macro and micro nutrients of each on browning and callus mass gain was also studied. Interchange of MS and WP macro and micronutrients produced more calli as compared to those of SH and EK. Histological examination of the calli revealed various morphogenetic changes. Wound callus and xylogenesis were observed on combination of MS micro and WP macronutrients. While caulogenesis was observed on MS macro and WP micronutrient combination.

Key words: *Pistacia vera*, Tissue culture, Caulogenesis.

Technology Section

Pak. j. sci. ind. res., vol. 38, no. 7, July 1995

ENHANCEMENT OF BRAIN REGIONAL TRYPTOPHAN CONCENTRATION FOLLOWING ADMINISTRATION OF DIAZEPAM: A DOSE RELATED STUDY

FARHAT BATOOL, TAHIRA PARVEEN AND DARAKHSHAN J. HALEEM

Department of Biochemistry, Neurochemistry and Biochemical Neuropharmacology Research Laboratory, University of Karachi, Karachi-75270, Pakistan

(Received July 17, 1994; revised February 27, 1995)

Administration of diazepam at doses of 1,3 and 5 mg/kg attenuated home cage activity and open field activity of rats. Plasma concentrations of total tryptophan decreased and those of free tryptophan increased in diazepam injected rats. The concentration of tryptophan increased in the hypothalamus, striatum and cortex but not in the brain stem of diazepam injected rats. The increases in the hippocampus were only marginal and occurred at high doses of the drug. The possible mechanism for the increased availability of tryptophan to the brain and decreased serotonin turnover reported in diazepam injected rats is discussed.

Key words: Diazepam, Tryptophan, Serotonin.

Pak. j. sci. ind. res., vol. 38, no. 7, July 1995

TEMPERATURE PROFILES IN ARGON ARCS BY OPTICAL EMISSION SPECTROSCOPY

SALIM AKBAR AND KASRA ETEMADI*
Department of Avionics, College of Aeronautical Engineering, PAF Academy, Risalpur, Pakistan

(Received November 25, 1993; revised July 12, 1995)

A fully-automated emission spectroscopic set-up has been employed to measure temperature profiles in free-burning argon arcs (1 atm, 13 mm electrode gap) by absolute line intensity of argon I lines at 6965, 7147 and 7635 Å, under the assumption of LTE. The following salient results were obtained: (a) the peak temperature, 4 mm below the cathode tip, varied from 10100 to 11050 K when arc current was varied from 75 to 300 A; (b) at 100, 150, 250 and 300 A, peak temperatures of 10865, 11113, 11293 and 11750 K were calculated, respectively, at increasing distances of 1 to 4 mm below the cathode; and (c) isotherms obtained from simultaneous/consecutive measurements of 6965, 7635 and 7147 Å lines at 200 A, yielded peak temperatures of 11658, 11157 and 11368 K, respectively, thereby suggesting that the self-absorption of the 7635 Å line has only a small effect on the extracted temperature profiles.

Key words: Temperature profiles, Emission spectroscopy, Argon arcs.

Short Comm

Pak. j. sci. ind. res., vol. 38, no. 7, July 1995

Studies on the Fixed Oil of the Seed of *Albizia Amara*

MUNIR AHMED AND SHADAB QAMAR
PCSIR Laboratories Complex, Lahore-54600, Pakistan

(Received January 1, 1993 ; Revised May 5, 1995)

Pak. j. sci. ind. res. vol. 38, no. 7, July 1995

Noise Study in a Synthetic Fibre Plant

G.H. SHAIKH AND NABI A. KHAN

PCSIR Laboratories Complex, Karachi-75280, Pakistan.

(Received December 7, 1994 ; revised May 17, 1995)

Pak. j. sci. ind. res., vol. 38, no. 7, July 1995.

Evaluation of Pakistani Sweet Basil Oil for Commercial Exploitation

L.M. Khatri, M.K.A. Nasir, R. Saleem and F. Noor*

PCSIR Laboratories Complex, Karachi-75280

(Received February 7, 1994; revised May 28, 1995)