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Physical Sciences

Pak J Sci Ind Res 2001 44 (5) 253-256

Determination of Mercury by Liquid Chromatography in Fresh Water Fishes Using 2-Thiophenaldehyde-4-Phenyl-3-Thiosemicarbazone

M Y Khuhawar and S N Languani*

Dr M A Kazi Institute of Chemistry, University of Sindh, Jamshoro, Sindh, Pakistan

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Co (II), Ag (I) and Hg (II) or Co (II), Ni (II), Fe (II), Cu (II) and Hg (II) are simultaneously extracted as metal chelates compounds of 2-thiophenaldehyde-4-phenyl-3-thiosemicarbazone (TAPT) in chloroform. The complexes were separated from microsorb C-18, 5 μm column when eluted with methanol/acetonitrile/water/aqueous sodium acetate 1m mol or methanol/acetonitrile/water/sodium acetate (1mmol) tetrabutyl ammonium bromide (1mmol) with a flow rate of 1 ml^{-1} and detection UV at 254 nm. Linear calibrations were made with 10-50 μg ml^{-1} and detection limit was 0.4 μg ml^{-1}, corresponding to 2 ng/injection in Co and Hg. The method was used for the determination of mercury in surface water fishes. It was found within 0.125 to 1.18 μg g^{-1} of fish muscles with coefficient of variation (C.V) 3.4-5.8%.

Key words: Liquid chromatographic technique, Fresh water fishes, Mercury.

Pak J Sci Ind Res 2001 44 (5) 257-262

SYNERGISTIC EFFECT BETWEEN THIOL COLLECTORS IN REACTION WITH SULPHIDE MINERALS

M Riaz, A R Khan, Mumtaz Khan, Kamin Khan and Asadullah Jan*

PCSIR Laboratories, Jamrud Road,Peshawar-25120, Pakistan

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The study of synergism between potassium ethyl xanthate (Ketx) and sodium diethyl dithiocarbamate (Dtc) in reaction with heazlewoodite (Ni_3S_2) is described. It has been demonstrated that its occurrence can be explored by simple cyclic voltametry and adsorption measurements. Correlation was obtained between flotation recoveries, adsorption isotherms and cyclic voltametry measurements. The maximum synergistic effect between Ketx and Dtc was observed at the ratio of 0.35:0.65.

Key words: Synergistic, Thio collectors, Sulphide minerals.

Pak J Sci Ind Res 2001 44 (5) 263-267

SYNTHESIS OF TERPOLYMER OF ETHYL ACRYLATE (EA), N-BUTYL ACRYLATE (N-BA) AND BUTYL METHACRYLATE (BMA) AND SOLUTION BLENDING WITH CHLORINATED RUBBER (CR)

A Rasheed Khan[*a], Khalil Ahmed*[a], *Kausar Ali Syed*[b] *and A F K Ifrahim*[b]

[a]*Fuel Research Centre, PCSIR Laboratories, Karachi 75280, Pakistan*

[b]*Plastic and Polymer Research Centre,PCSIR Laboratories Complex, Karachi-75280, Pakistan*

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Free radical terpolymerization of ethylacrylate, n-butyl acrylate and butyl methacrylate has been carried out at 95°C using benzoyl peroxide as initiator. It has been observed that the three monomers polymerized simultaneously and form terpolymer in all monomeric ratios. EA enters in the growing polymer chain more rapidly than n-BA and BMA. The terpolymers of 24130-38575 molecular weight are obtained. All terpolymer samples are highly tacky transparent viscous material. The refractive index of terpolymer samples ranges 1.495-1.497. It may be used as tackifying agent in the preparation of adhesive. Besides, the blends of chlorinated rubber and terpolymer alongwith plasticizer may be used as a good film forming materials in the surface coating of leather.

Key words: Terpolymerization, Ethylacrylate, Chlorinated rubber, Flexible.

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PYRAZOLE AROYL HYDRAZONES AS LIGANDS-I 1,3-DIPHENYLPYRAZOLE-4-CARBOXALDEHYDE BENZOYL HYDRAZONE AS LIGAND FOR METAL COMPLEXES

Irshad Ahmad[a], Misbahul Ain Khan[b] and Makshoof Athar[b]*

[a] *Department of Chemistry, Government Gordon College Rawalpindi, Pakistan*

[b] *Department of Chemistry, Islamia University, Bahawalpur, Pakistan*

(Received 9 December 1999; accepted 12 April 2001)

The 1, 3-diphenylpyrazole-4-carboxaldehyde benzoyl hydrazone on reaction with various metals gave corresponding complexes which were characterized through their metal analysis and by applying spectrophotometeric techniques. Stability constants of these complexes were also calculated by spectrophotometric Job's continuous variation method. A tentative structure of complexes involving co-ordination through nitrogen and oxygen of the hydrazone moiety with the metals is suggested.

Key words: Pyrazole, Carboxaldehyde, Benzoylhydrazone, Metal complexes, Spectrophotometric techniques, Stability constant.

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SYNTHESIS AND CHARACTERIZATION OF COMPLEXES OF CO (II), NI (II) AND CU (II) WITH 1-HYDROXYL-2, 3-DIPHENYL-6-AMINO-MERCAPTO-1, 4, 5-TRIAZA-1, 3-HEXADIENE (HL)

Ramesh Kumar*, Madhulika Vatsa, K K Sharma, Saroj Kumari and H C Rai

Department of Chemistry, L S College, Muzaffarpur-842001, India

(Received 12 February 1999; accepted 25 July 2001)

A number of binuclear metal complexes of the type $[ML(H_2O_2]_2X_2$ where HL = 1-hydroxy -2,3-diphenyl-6- amino -6-mercapto -1,4,5 - triaza - 1,3 - hexadiene, M = Co(II), Ni(II) and Cu(II), $X = \bar{C}l, \bar{B}r, N\bar{O}_3, C\bar{l}O_4$ have been synthesized and characterized by elemental analyses, magnetic susceptibility, infrared and electronic spectral data.

Key words: Metal complex, Schiff base ligand, Transition metal

Short Communication

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SYNTHESIS OF 3-HYDROXY-3′,4′-METHYLENEDIOXY-6″,6″-DIMETHYLPYRANO (2″,3″:7,8) FLAVONE

M Amzad Hossain

Chemistry Division, Atomic Energy Centre, Ramna, Dhaka-1000, Bangladesh

(Received 11 September 1999; accepted 15 November 2000)

3-Hydroxy-3′,4′-methylenedioxy-6″,6″-dimethylpyrano (2″

Biological Sciences

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Quantitative Studies on the Vegetation of Islamabad

Saleem Ahmad[a]* and Ziaud Din Khattak[b]

[a]Pakistan Museum of Natural History, Garden Avenue,Islamabad,Pakistan

[b]Pakistan Environment Protection Agency, Islamabad,Pakistan

(Received 1 February 2000; accepted 16 September 2000)

Quantitative studies on the vegetation of Islamabad were conducted during spring-summer, 1998. Phytosociological observations were made and 17 plant communities were recognized in the area on the basis of highest importance value. *Acacia modesta* Wall. was the dominant tree of the study area, occurring as first dominant in 6 out of 17 stands, followed by *Broussonetia papyrifera* Vent. (first dominant in 3 stands), and *Dalbergia sissoo* Roxb.(first dominant in 2 stands). *Justicia adhatoda* L. was the dominant shrub (first dominant in 3 stands). It was observed that the original natural and xerophytic vegetation in the central areas has been changed into mesophytic type due to large-scale cultivation of trees.

Key words: Vegetation, Quantitative studies, Islamabad.

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THE ANTHELMINTIC ACTIVITY OF *HUNTERIA UMBELLATA* K SCHUM (FAM. APOCYNACEAE) EXTRACTS

Asije Oluwemimo[a]* and Cyril Odianose Usifoh[b]

[a]Department of Pharmacognosy, Faculty of Pharmacy, University of Benin, PMB 1154, Benin City, Nigeria

[b]Department of Pharmaceutical Chemistry, Faculty of Pharmacy, University of Benin, PMB 1154, Benin City, Nigeria

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Aqueous and methanolic extracts of the leaves, seeds and stembark of *Hunteria umbellata*. K. Schum, were tested for anthelmintic activity. The extracts of the leaves, seeds and stem bark have significant anthelmintic activity when compared with normal saline which acted as control. The methanolic extract of the stembark had the highest activity for all the extracts. However, the activity of the aqueous extract of the seeds was more effective than the aqueous extract of the leaves and stembark.

Key words: *Hunteria umbellata*, Helminthiasis, Aqueous extracts, Methanolic extracts.

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DETERMINATION OF MAJOR AND TRACE ELEMENTS IN *ARTEMISIA ELEGANTISSIMA* AND *RHAZYA STRICTA* AND THEIR RELATIVE MEDICINAL USES

F A Kaneez*, M Qadiruddin, M A Kalhoro, S Khaula and Y Badar

PCSIR Laboratories Complex, Off University Road, Karachi-75280, Pakistan

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Artemisia elegantissima and *Rhazya stricta* have been explored to determine major and trace elements and their possible role in human health. Thirteen trace elements have been studied in both the plants which were found to be rich in Cu, Co, Fe, Mg, Mn and Zn. These trace elements are reputed being main constituents for human health and for curing some diseases. They are also found to be rich in nutrient elements which are best source for fodder.

Key words: Indigenous medicinal plants, Trace elements and human health, *Artemisia elegantissima, Rhazya stricta.*

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STUDIES ON THE EFFICIENCY OF COWDUNG COMPOST AS FOOD PRODUCER IN CARP *(CYPRINUS CARPIO)* CULTURE

Khalid Jamil[a]*, Razia Sultana[a], Abbas Shah[a] and Lin Hong[b]

[a]Applied Biology and Marine Resources, PCSIR Laboratories Complex, Karachi 75280, Pakistan

[b]Department of Fisheries, Ocean University, Qingdao, P R China

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Studies were undertaken to determine the efficiency of composted bio waste in carp *(Cyprinus carpio)* culture for a period of 180 days. Growth of fish was measured in terms of weight. The main increase in weight per fish at the end of the culture period was recorded in control, treated group A (compost) and treated group B (compost and feed) respectively. Statistically significant differences were found between the weight of experimental fish under control, treatment A and B groups. In this experiment none of the values recorded for water chemistry was beyond the tolerance of fish. It is concluded that with bio waste favourable change could be achieved in fish culture, which would help to reduce the running cost of the fish culture.

Key words: *Cyprinus carpio*, Cow dung, Compost, Fish culture.

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Effect of Planting Methods on the Growth and Yield Attributes of Two Sunflower Cultivars

S D Tunio[a], Munwar M Solangi[a], M U Samo[b] and V Suthar[c]*

[a] *Department of Agronomy, Sindh Agriculture University, Tandojam, Pakistan*

[b] *Oilseed Section, Agriculture Research Institute, Tandojam, Pakistan*

[c] *Department of Statistics, Sindh Agriculture University, Tandojam, Pakistan*

(Received 12 March 1998; accepted 26 January 2001)

A study to test the influence of planting methods on the growth and yield of two sunflower cultivars was conducted at the Oilseed Section Agriculture Research Institute, Tandojam Pakistan during 1997. The experimental treatments included two planting methods viz. ridges and flat and two varieties viz: PSF-022-424 and HO-1. The results revealed that both the varieties produced significantly different seed yield ha^{-1}, whereas, planting methods had non-significant effects on the yield and its attributes. HO-1 had the tallest plants, more leaves, more stem girth, largest head size and more biomass yield under flat planting. However, higher seed yield was produced by HO-1 under ridge planting.

Key words: Sunflower, Planting methods, Yield.

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ANTIMICROBIAL ACTIVITY AND PHYTOTOXICITY OF STEROLS FROM *CHARA WALLICHII* A. BR. (CHAROPHYTA)

Syed Muhammad Khaliq-uz-Zaman[a], K Simin[a] and Mustafa Shameel[b]*

[a]*Pharmaceutisches Institut, Albert-Ludwigs-Universität, Hermann-Herder-Strasse 9, D-79104 Freiburg, F.R. Germany*

[b]*Centre of Excellence in Marine Biology, University of Karachi, Karachi-75270, Pakistan*

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The antibacterial, antifungal and phytotoxicity tests were performed on the methanolic extract, ethylacetate fraction and four sterols isolated from the green alga *Chara wallichii* A. Br., collected from flood water of River Indus, near Petaro, Sindh, Pakistan. The compounds named as cholesterol (1), clerosterol (2), stigmasterol (3) and β-sitosterol (4) have been isolated for the first time from this alga and their antimicrobial activities as well as phytotoxicity studies are being reported.

Key words: *Chara wallichii*, Charophyta, Algae, Antifungal activity, Antibacterial activity, Phytotoxicity, Sterols.

Pak J Sci Ind Res 2001 44(5) 308-311

PRODUCTION OF HIGH TITRE ANTISERA IN RABBITS AGAINST *CLOSTRIDIUM PERFRINGENS* BETA AND EPSILON TOXOIDS

M S Rahman[ab]* and M M Rahman[c]

[a]Department of Medicine, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh

[b]College of Veterinary Medicine, Chonbuk National University, Chonju 561-756, South Korea

[c]Department of Microbiology and Hygiene, Bangladesh Agricultural University, Mymensingh, Bangladesh

(Received 30 November 1998; accepted 29 May 2001)

To investigate the validity of production of high titre antisera against *Clostridium perfringens* beta and epsilon toxoids in rabbit, the immune response of these toxoid inoculated rabbits were measured. The highest neutralizing antibody titres from the beta and epsilon toxoids were equally $\log_{10}1.50 \pm 0.042$ on 21st day post-inoculation of toxoid. The precipitating antibodies were detected by agar gel immunodiffusion test on the above mentioned period. Statistically significant ($P<0.01$) rise of antibody titre was observed from 14th day to 21st day post-inoculation of toxoid. Antibody production did not vary significantly due to interaction between day of inoculation and toxoid. It suggested the utility of rabbit for excellent production of high titre antisera against *Clostridium perfringens* beta and epsilon toxoids.

Key words: High titre antisera, *Clostridium perfringens*, Antibody, Toxoid.

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Quantitative Estimation of Diacetylmorphine by Preparative TLC and UV Spectroscopy

L Khan*, M T Siddiqui, N Ahmad and N Shafi

Medicinal Botanic Centre PCSIR Laboratories, Peshawar-25100, Pakistan

(Received 23 July 1998; accepted 10 March 2001)

A simple and efficient method for the quantitative estimation of diacetylmorphine in narcotic products has been described. Comparative TLC of narcotic specimens with standards showed presence of morphine, monoacetylmorphine, diacetylmorphine papaverine and noscapine, Resolution of the mixtures was achieved by preparative TLC. Bands corresponding to diacetylmorphine scraped, eluted UV absorbtion of extracts measured and contents quantified.

Key words: Heroin, Adulterated, Estimation, Diacetylmorphine.