THE NONALKALOIDAL CONSTITUENTS OF RAUWOLFA VOMITORIA AFZUElia

Abdul Malik and Salimuzzaman Siddiqui

H.E.J. Postgraduate Institute of Chemistry, University of Karachi, Karachi 32

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Steroidal constituents and fatty acids of Rauwolfia vomitoria have been isolated and identified. The chemical and spectral studies on serpsterol provided evidence for the structure: 28-hydroxy stigmasterol.
INFRARED SPECTROSCOPIC CHARACTERISATION OF DONOR–ACCEPTOR COMPLEXES OF DINITROBENZENES WITH N-SUBSTITUTED ANILINES

A.E. El-Kholy, Y.M. Issa, Y.A. Marghalani and R.M. Issa

Chemistry Department, Faculty of Education, King Abdulaziz University, Mecca, Saudi Arabia

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The donor–acceptor complexes of eight N-substituted anilines with five dinitrobenzenes are prepared and their IR spectra are recorded in the solid state as KBr discs. Based on the spectral shifts due to complex formation, four types of charge transfer interactions are pointed out. The spectral characterisation of each class is given.
IRON-SORBITOL, DEXTRIN AND CITRIC ACID COMPLEX

Jameela Jafri, (late) Sami Ahmad Khan and S.A.H. Zaidi

PCSIR Laboratories, Karachi

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Preparation containing complex of iron, sorbitol, dextrin and citric acid is described. Complex formation with sorbitol alone or in conjunction with citric acid is not satisfactory and dextrin is an essential component for its stability.
FRAGMENTATION OF NAPHTHOXAZOLES UNDER ELECTRON IMPACT

Saoud A.M. Metwally, Afaf A.M. Gadalla and Youssef A.M. Marghliani

Chemistry and Physics Department, King Abdul-Aziz University, Mecca, Saudi Arabia

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The mass spectra of seven naphthoxazole derivatives were examined. Of these compounds, only phenylnaphthoxazole and 2-\(p\)-(aminophenyl) naphthoxazole were characterised by a prominent molecular ion (often responsible for the base peak) and also the presence of doubly charged ions with high relative abundance. One of the main features of decomposition of the parent naphthoxazole is the elimination of carbon monoxide and hydrogen cyanide. A mechanism for these fragmentations has been proposed.
PHOTOMETRIC DETERMINATION OF INDOLE COMPOUNDS IN THE FORM OF CHARGE TRANSFER COMPLEX

A. Qazi Nawab Manzar* and A.N. Kost

Faculty of Chemistry, Moscow State University, Moscow, U.S.S.R.

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A photometric method is developed for the quantitative analysis of indole nucleus compounds with 2,6-dichloroquinone-4-chlorimide in the form of charge transfer complex (CTC). The method is simple and suited for routine quantitative analysis of indole compounds. Each determination can be performed approximately in 60 min.
STOBBE CONDENSATION ON 1-ACETYL-2-METHOXY NAPHTHALENE

A. Essawy and A.Z.M. Heikal

Faculty of Science, Zagazig University, Zagazig, A.R. Egypt

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1-Acetyl-2-methoxy naphthalene was condensed with diethyl succinate in the presence of \((\text{CH}_3)_3\text{COK}\) to give two stereoisomeric half esters (I) and (II). The structures of these isomers were proved by chemical reactions.
ACTION OF AMINES, HYDRAZINES AND HYDROXYLAMINE HYDROCHLORIDE ON 3-BENZYLIDENE-5-(2-METHYL-1-NAPHTHYL)-2 (3H) FURANONE

M.A. El-Hashash and M. Abdalla

Faculty of Science, Ain Shams University, A.R. Egypt

A. Essawy and A.M. El-Gendy

Faculty of Science, Zagazig University, A.R. Egypt

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3-(2-Methyl-1-naphthoyl) propionic acid (I) reacted with benzaldehyde, benzyl methyl ketone, \( \text{Br}_2/\text{POCl}_3/\text{CHCl}_3 \), \( \text{NH}_2\text{OH.HCl} \) and semicarbazide to give furanone, pyrrolidinone, acrylic acid, oxazinone or semicarbazone derivatives. The reaction of furanone (II) with amines, ammonium acetate, hydrazines and \( \text{NH}_2\text{OH.HCl} \) has been investigated.
IDENTIFICATION OF FISH AND SHRIMP BY POLYACRYLAMIDE GEL ELECTROPHORESIS

Zahida N. Umar and R.B. Qadri

PCSIR Laboratories, Karachi

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Muscle extracts of fifteen fish and shell fish varieties belonging to different genera were examined by acrylamide gel electrophoresis in tris-glycine and tris-HCl buffers of pH 8.9 and 8.1 respectively. The electrophorogram of each fish examined had characteristic details making it possible to identify fish by means of an electrophoretic analysis of muscle extract made in prescribed conditions.
EFFECT OF NITROGENOUS, PHOSPHATIC AND POTASSIC FERTILIZERS ON THE YIELD AND CHEMICAL COMPOSITION OF MAIZE

Iftikhar Hussain and Muhammad Yaqub

Department of Chemistry, University of Agriculture, Faisalabad

Muhammad Yasin Ahmed

Biochemistry Section, Ayub Agricultural Research Institute, Faisalabad

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The effect of N, P and K fertilizers on yield and chemical composition of maize was studied in the field. The application of 53.52 kg N/ha alongwith 26.76 kg P/ha gave the maximum and economical yield of maize grain, whereas the further upper levels of these fertilizers reduced the grain yield. Moreover, the application of 58.14 kg K/ha did not show any response towards yield increase. This may be due to the sufficient level of potassium already in the soil. The moisture content of maize grain increased with the application of various N, P and K fertilizers. Crude protein of the grain increased significantly with the application of various N fertilizer treatments. The mineral matter, calcium and phosphorus contents of the maize grain increased significantly by the application of the fertilizers as alone or in various combinations. The combined application of the upper levels of N, P and K fertilizers showed the maximum content of mineral matter, calcium and phosphorus.
NUTRITIONAL STUDIES FOR DRY MATTER YIELD AND MINERAL CONCENTRATION OF CROPS

Part I. Effect of Nutrients on Rice (*Oryza stiva*)

Mohammad Saleem Saif

*Agricultural University, Tandojam*

Abdul Jabbar Rana

*Agricultural University, Faisalabad*

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The results of a fertilizer experiment conducted in a calcareous soil revealed that the rice crop responded well to the addition of nitrogen, phosphorus, copper and zinc. The effect of nitrogen was more pronounced than phosphorus in macronutrients and copper was more effective among micronutrients, in raising the dry matter yield of the crop. Treatments like NPCuZn, NPCu, NPCuMn, NPZn, NPCuZnMn and NPZnMn were comparatively more suitable than other combinations. A tendency called antagonism, among nitrogen, phosphorus, copper, zinc and manganese is observed in mineral concentrations of the crop. The antagonistic trend was more clear in copper, zinc and manganese than other nutrients.
NUTRITIONAL STUDIES FOR DRY MATTER YIELD AND MINERAL CONCENTRATION OF CROPS

Part II. Effect of Nutrients on Sorghum (*Sorghum volgare*)

Mohammad Saleem Saif

*Sind Agriculture University, Tandojam*

Abdul Jabbar Rana

*Agricultural University, Faisalabad*

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The sorghum crop when grown in a calcareous sandy-loam soil (pH 8.2), responded well to the application of nitrogen, phosphorus, copper, zinc and manganese. The results were more favourable in case of combined treatments than with single applications. Thus, such combinations like, NPCuZn, NPCu, NPCuMn, NPZn were comparatively more efficient to increase the dry matter yield of the crop. The analysis of the crop for mineral concentration revealed that the addition of any one of the element among nitrogen, phosphorus, copper, zinc and manganese strongly decreased the concentration of other elements in plants. In this respect single treatment, i.e. NCu, NZn, NMn, NPCu, NPZn and NPMn were more effective than full combinations like NCuZnMn and NPCuZnMn, NPCuZn, NPZnMn and NPCuMn in depressing the mineral concentrations.
LABORATORY FUMIGATION TESTS OF PHENYL ISOTHIOCYANATE AGAINST FOUR LABORATORY-READED INSECTS

Saleem A. Qureshi, Shams Mohiuddin and B.A. Khan

PCSIR Laboratories, Karachi 39

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The knockdown effectiveness of phenyl isothiocyanate individually and in combination with propylene oxide, terpentine, 100-octane and CCl₄ was tested on Musca domestica (L). In order to obtain the same KD₅₀, in a range of 8–17 min, the required quantity of phenyl isothiocyanate was approximately 73, 38 and 31 times lower than propylene oxide, terpentine and 100-octane respectively.

The addition of the above-mentioned fumigants decreased the knockdown value of phenyl isothiocyanate.

The order of fumigation toxicity for Tribolium confusum (Duv) at lethal level is DDVP > phenyl isothiocyanate > o-xylene > methanol. Tribolium confusum (Duv) seemed to be more susceptible to the vapours of phenyl isothiocyanate than Bruchus chinensis (L). The mustard compound (phenyl isothiocyanate) proved to be extremely toxic to Schistocerca gregaria (Forskal) nymphs at 1 mg/l dose; producing complete kill after 5-hr exposure.
Technology Section


THE IN-VITRO STUDY OF SUSTAINED RELEASE ASPIRIN TABLET WITH POLYETHYLENE RESIN AS INSOLUBLE MATRIX

M. Hafeez Khan and Mahbub Alam

Department of Pharmacy, Punjab University, Lahore Pakistan

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A method for sustained release aspirin tablet was developed by using polyethylene resin as insoluble matrix and ethylcellulose as a binding agent. The effect of pressure and binding agent such as ethylcellulose on release rate of aspirin was determined. The degradation of aspirin in sustained release tablets was also studied.
UTILIZATION OF ALMOND SEED CAKE

W.H. Shah, B.A. Mahmood and F.H. Shah

PCSIR Laboratories, Lahore 16

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Almond seed cake syrup was prepared and the material left after water extraction was used in the preparation of biscuits. The syrup contained 1.4% protein and was organoleptically acceptable up to storage of 60 days. 10% addition of the extracted cake to normal formula constituents of biscuits increased protein content of the biscuits considerably without affecting the acceptability of the product. The storage of biscuits up to 60 days did not affect their organoleptic acceptability.
Review


CHROMITE ORES OF PAKISTAN AND THEIR BENEFICIATION — A CASE STUDY*

A.A. Qureshi, N. Shaikh and Izharul Haq

PCSIR Laboratories, Lahore 16

This case study describes the present position of chromite ores of Pakistan with special reference to the Zhob valley and Malakand areas. The study touches upon the general geology, mining, grade, beneficiation and exports. A review on the work previously done on the concentration of Muslimbagh chromite has been included. Work done in the PCSIR on upgradation of low grade chromites of Zhob valley and Malakand on bench as well as on pilot-plant scale has also been described.