ISSN 0030 - 9885
Coden: PSIRAA 35 (1–2) 1–66 (1992)

PAKISTAN JOURNAL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Vol. 35, Nos. 1–2, January-February 1992

Published monthly by

Scientific Information Centre
PAKISTAN COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH
KARACHI

Physical Sciences Section

Pak. j. sci. ind. res., vol. 35, nos. 1-2, January-February 1992

DETERMINATION OF Cu(II) ION BY POLAROGRAPHIC AND SPECTROPHOTOMETRIC MEASUREMENTS OF ITS 3-(2-ACETYL-PHENYLHYDRAZO)-β-DIKETONE COMPLEXES

B.A. EL-SHETARY, S.L. STEFAN, M.S.ABDEL-MOEZ AND M.M. MASHALY
Chemistry Department, Faculty of Education, Ain Shams University, Roxy, Cairo, Egypt

(Received September 30, 1991; revised March 17, 1992)

The UV, visible and IR spectra of 3-(2- acetylphenylhydrazo) pentane-2, 4-dione (2- APHA), 2- (acetylphenylhydrazo)-1-phenyl-1, 3- butane dione (2-APHB), 3-(2- acetylphenylhydrazo)-1,3-diphenyl-1, 3-propane dione (2-APHDB) and 3-(2-acetylphenylhydrazo)- 5, 5-dimethyl-1,3-cyclohexane dione (2-APHDm) ligand were studied. The effect of the dielectric constant of different mixed solvents on the dissociation constants of (2- APHDm) and (2-APHDB) ligands were also studied.

The polarographic study of 2-APHDm, 2- APHB and 2-APHA, ligands shows a single defined irreversible wave at different pH's. The $E_{1/2}$ and i_d were found to be pH dependent. The mechanism of reduction of the studied organic ligands was proposed.

The composition and stability constants of Cu(II) complexes of 2-APHDm, 2-APHA and 2- APHB ligands were determined spectrophotometrically at optimum pH (5.5). The absorbance of the formed complexes were found to obey Beer's law which may be useful in microdetermination of Cu(II) ions. The polarographic behaviour of Cu(II)-ligand mixtures shows that E 1/2 is pH dependent. The nature of the complex wave is largely diffusion controlled. The logarithmic analysis of this wave at different pH's indicates that the wave is irreversible.

Key words: Cu(II)-ligands, Azo-β-diketone, Complexes, Spectroscopy.

Pak. j. sci. ind. res., vol. 35, nos. 1-2, January-February 1992

TRISUBSTITUTED PYRAZOLES OF POSSIBLE HYPOGLYCEMIC ACTIVITY

H.M. FAIDALLAH, MOHAMED M. EL SADEK, A.M.I. EL-MASSRY AND SAHAM Y. HASSAN

Chemistry Department, Faculty of Science, Alexandria University, Alexandria, Egypt

(Received July 15, 1991; revised February 16, 1992)

Condensation of *p*-sulfamylphenylhydrazine with chalcones, leads either to hydrazones (2) or to pyrazolines (3). Oxidation of (3) afforded pyrazole derivatives (4). Benzenesulfonylureas (5 and 6; Z=O) and thioureas (5 and 6; Z=S) were also prepared and converted to the corresponding thiazolidinones (7) and thiazinone (8) derivatives.

Key words: Pyrazolines, Ureas, Thioureas.

Pak. j. sci. ind. res., vol. 35, nos. 1-2, January-February 1992

MINERALOGICAL AND CHEMICAL STUDIES OF FELSPARS FROM SWAT AND HAZARA IN NWFP, PAKISTAN

FAZAL SIDDIQUI, HAMEEDULLAH KHAN, NISAR AHMAD AND RAB NAWAZ KHAN*
PCSIR Laboratories, Peshawar-25120, Pakistan

(Received February 21, 1991; revised February 1, 1992)

Petrological, X-ray diffraction and chemical studies of felspar samples from the Hazara and Swat in NWFP established the presence of soda-spars and potash-spars. Moreover, these two types of felspar are amenable to commercial exploitation for use in glass and ceramic industries.

Key words: Felspar, Swat, Hazara, Pakistan, Ceramic.

Pak. j. sci. ind. res., vol. 35, nos. 1-2, January-February 1992

SYNTHESIS AND REACTIONS OF 2-(α-NAPHTHYLMETHYL)-(4H)-3, 1-BENZOXAZIN- 4-ONE

A. F. EL-FARARGY, M. M. HAMAD, S. A. SAID, A. F. SAYED AHMED AND G. M. EL-GENDY

Chemistry Department, Faculty of Science, Zagazig University, Zagazig, Egypt

(Received January 1, 1992)

2-(α-Naphthyl methyl)-(4H)-3, 1-benzoxazin-4-one (1) was prepared. The reactivity of compound (1) towards different nitrogen nucleophiles was studied. Also, the effect of P_2S_5 and perchloric acid on compound (1) has been investigated.

Key words : Benzoxazines, Aromatic amines, P_2S_5.

Pak. j. sci. ind. res., vol. 35, nos. 1-2, January-February 1992

SOME ASPECTS ON THE THERMAL DECOMPOSITION OF ACETOPHENONE G-P COMPLEXES OF Zn, Cd AND Hg

M. E. M. EMAM

Chemistry Department, Mansoura University, Mansoura, Egypt

(Received May 4, 1990; revised February 11, 1992)

The kinetic and thermodynamic parameters relating to the thermal decomposition of Zn (II), Cd (II) and Hg (II) hydrazone complexes of general formula $[MCl_2(L)_2]Cl_2$; where L=Acetophenonearbohydrazone pyridinum cation; $C_6H_5\text{-}\underset{CH_3}{\underset{|}{C}}=\underset{H}{\underset{|}{N}}.N.CO\text{-}CH_2\text{-}N^+(C_5H_5)$ and M = Zn (II), Cd (II) or Hg (II), were evaluated from TG and DSC data. The thermal stabilities of these complexes were discussed in terms of the nature of the central metal ion present.

Key words: Thermal decomposition, Acetophenone G-P complex, Thermal stability.

Introduction

vacuum dried over anhydrous calcium chloride. The solid

Pak. j. sci. ind. res., vol. 35, nos. 1-2, January-February 1992

THE KINETIC OF THE HYDROLYSIS OF SOME MONO AND BIFUNCTIONAL REACTIVE DYES

AHMED SHAWKI, AHMED M. G. NASSAR AND MOHAMED A. KHARABA*
Faculty of Science, Alexandria University, Alexandria, A.R.E.

(Received; October 4, 1991, revised March 5, 1992)

The kinetics of the nucleophilic reaction of three mono and two dichlorotriazinyl reactive dyes were studied over a range of temperature between 70-90°and pH values of 9.22- 11.14. Also, the rate of the reaction with mannitol was determined in order to study the suitability of the dyes.

Key words: Hydrolysis, Reactive, Dyes.

Pak. j. sci. ind. res., vol. 35, nos. 1-2, January-February 1992

SCIENTIFIC INVESTIGATIONS ON SURMA

QAMAR KHALID, MARYAM MIRZA, MOHAMMAD QADEERUDDIN, ZAKIR-UR- RAHMAN, I. H. QURESHI AND S. S. H. RIZVI
PCSIR Laboratories Complex, Karachi-75280, Pakistan

(Received February 13, 1991; revised February 13, 1992)

Studies were undertaken to investigate lead levels in the blood of rabbits as a sequel of surma application to their eyes for 60 days and also to observe harmful effects if any. For this purpose blood was sampled at 15 days intervals and analysed for lead content employing atomic absorption spectroscopy. No significant difference in blood lead levels was found among the treated and control animals. Moreover, studies on rats were carried out by intraperitoneal administration of surma which also showed no toxic/untoward effects on animals.

Key words: Surma, Application to eyes, Blood lead levels.

Biological Sciences Section

Pak. j. sci. ind. res., vol. 35, nos. 1-2, January-February 1992

COMPARATIVE STUDIES ON COMPOSITION OF COMMERCIAL INDIGENOUS AND IMPORTED APPLE VARIETIES

F.M. KHAN, EIJAZUDDIN AND A. JABBAR
PCSIR Laboratories, Jamrud Road, Peshawar, Pakistan

(Recieved July 17, 1991; revised February 11, 1992)

Some common varieties of apple produced in different areas of Pakistan as well as the imported popular Kabli variety (Red delicious) were assessed, for nutrients and minerals. Comparison of the values showed that as far as the common fruit quality characteristics such as sugar, ascorbic acid, acidity, pectin, tannins are concerned, there were only slight differences. In some respects some of the indigenously grown varieties were superior. In others, such as the minerals (Na and K) the imported Kabli variety had a slight edge over the locally produced fruit. Based on these data it can be said that inspite of their high market prices, the imported Kabli apples, did not show any great precedence in their overall nutritional constituents that have been investigated, over their indigenously grown counterparts.

Key words: Pakistani apples-varietal, Kabli variety, Minerals and nutrients composition.

Pak. j. sci. ind. res., vol. 35, nos. 1-2, January-February 1992

MICRASTERIAS IN PAKISTAN

FAZLI MALIK SARIM AND M.A.F. FARIDI

Department of Botany, University of Peshawar, Peshawar, Pakistan

(Received April 16, 1990; revised February 3, 1992)

Nineteen taxa of Micrasterias, Desmidiaceae, have been described from Pakistan. All these taxa are new records for the country. The description is accompanied with a key for identification and *(Camera lucida)* drawings.

Key words: Taxonomy, Micrasterias, Pakistan.

Introduction

Materials and Methods

Pak. j. sci. ind. res., vol. 35, nos. 1-2, January-February 1992

LIPID STUDIES OF *CARICA PAPAYA*

M.Y. Raie, Kamran Sohail*, Manzoor Ahmad and Ehsan Elahi Qureshi*
PCSIR Laboratories Complex, Lahore-54600, Pakistan

(Received July 31, 1991; revised February 11, 1992)

The air dried seeds of *Carica papaya* contains moisture 4.0%, oil 25.6%, minerals 17.8%, proteins 36.6%. The fatty acid composition of yellow coloured oil is $C_{14:0}$ (1.2%), $C_{16:0}$ (17.8%), $C_{18:0}$ (5.9%), $C_{18:1}$ (63.3%), $C_{18:2}$ (9.9%), $C_{20:0}$ (Traces), $C_{22:0}$ (1.9%). The unsaponifiable is determined as sterols (27.5%), alcohols (40.0%) and hydrocarbons (15.0%). The Hydrocarbons (C_{15} - C_{36}) and alcohols (C_{12} - C_{18}) have been separated, identified and characterized by the application of thin layer and gas liquid chromatography.

Key words: Fatty acid, Fatty alcohols, Hydrocarbons.

Pak. j. sci. ind. res., vol. 35, nos. 1-2, January-February 1992

SOME OF THE NUTRITIONAL COMPONENTS OF *SPINACIA OLERACEA, CARDARIA CHALEPENSE* AND *RUMEX DENTATUS*

ABDUS SATTAR KHAN AND NUSRAT BEGUM

Biochemistry Division, Department of Chemistry, University of Peshawar, Peshawar, Pakistan

(Received April 2, 1991)

Total lipids, proteins, calcium, iron and vitamin-C, of *Cardaria chalepense, Rumex dentatus* and *Spinacia oleracea* were determined. The Bligh and Dyer procedure was used for the total lipids, while the protein content were determined by the Micro-Kjeldahl's method. Amount of calcium was calculated using official micro-method (AOAC). Iron contents were estimated spectrophotometrically (AOAC). While 2, 6-dichlorophenol indophenol procedure was adopted for vitamin-C.

Key words : *Cardaria chalepense, Rumex dentatus, Spinacia oleracea*, Some nutrients.

Pak. j. sci. ind. res., vol. 35, no. 1-2, January-February 1992

EVALUATION OF *LENTIL GERMPLASM*

A. BAKHSH, A. GHAFOOR AND B.A. MALIK

Pulses Programme, National Agricultural Research Centre, Islamabad, Pakistan

(Received September 6, 1990; revised February 19, 1992)

Lentil germplasm consisting of 198 accessions (local as well as exotic) were evaluated for days to flowering, plant height, number of primary branches, number of secondary branches, number of pods/plant, days to maturity and yield/plant (gm). Considerable variability was observed for the characters studied. Use of short statured and early maturing lines like Flip 88-46L, ILL- 1703 and ILL-707 in breeding programme has been suggested for the development of high yielding varieties.

Key words: *Lentil germplasm,* Variability, Classification, Quantitative characters.

Technology Section

Pak. j. sci. ind. res., vol. 35, nos. 1-2, January-February 1992

STEADY STATE STABILITY IMPROVEMENT BY POWER SYSTEM STABILIZER INSTALLATION

Z. ELRAZAZ, ABDULAZIZ A. EL-SULAIMAN AND M. BARAKAT

Electrical Engineering Department , College of Engineering, King Saud University, Riyadh, Saudi Arabia

(Received April 22, 1989; revised January 27, 1992)

This paper addresses the choice of power system stabilizers for the interconnected system between Eastern and Central utilities of Saudi Arabia. The two utilities are connected via tie line of 380 kV double circuit and 230 kV double circuit - 500 km long. Eastern utility generation is mainly by large steam turbines and facing the reactive energy (MVAR) coordination with different mode of operation. The Central Region's generation is mainly by gas turbines. The composition and type of load in the two utilities are different. The study adopted eigenvalue linearized technique to simulate the system behaviour. The outcome of this study is to suggest appropriate locations and parameters values for power system stabilizer (PSS) to improve the steady state stability of the overall integrated system.

Key words: Stability, Stabilizer, Installation.

Pak. j. sci. ind. res., vol. 35, nos. 1-2 January-February 1992

PROCESSING OF BESHAM LEAD-ZINC ORE FOR THE PRODUCTION OF LEAD-ZINC BASED CHEMICALS

M. SHAFIQ ANWAR*, K. R. KAZMI, R. A. GOHAR AND NASEERUDDIN SHEIKH
PCSIR Laboratories Complex, Ferozpur Road, Lahore-54600, Pakistan

(Received February 9, 1991; revised March 11, 1992)

Lead and zinc concentrates from Besham lead-zinc ore were produced by forth flotation method. A number of alternative frothers/collectors and depressant were tested and flotation parameters including pH, conditioning time, frother/collector concentration and pulp density were optimised. A series of flotation tests were carried out on bench scale as well as on pilot plant scale to produce the lead and zinc concentrates. The grade of each one of the concentrates was about 50% metal content. These concentrates were used as raw material to produce lead and zinc based chemicals.

Key words: Besham ore, Froth flotation, Chemical grade.

Pak. j. sci. ind. res., vol. 35, nos. 1-2, January-February 1992

PURIFICATION OF RICE HUSK ASH TO UPGRADE ITS SILICA CONTENT

M. S. NIZAMI, M.K. FAROOQ AND M. ZAFAR IQBAL*

PCSIR Laboratories Complex, Lahore-54600, Pakistan

(Received July 12, 1991; revised February 3, 1992)

Rice husk with 92.01% silica was subjected to different procedures to upgrade silica content and purify it. Treatment with an oxidant (HNO_3) at 500°, alkali leaching with boiling water, digestion with dil. HCl (pH, 2.95) at 95° and dry state thermal treatment in electric furnace at 700° for 30 mins were tried. XRD analysis before and after the dry state thermal treatment was carried out. Last two procedures were proved to be the most efficient. So processed RHA resulted in 98.50% pure silica. Amorphous character of silica was not altered during treatment at 700°.

Key words: Rice husk ash, Silica contents, Purification.