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Physical Sciences Section

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REACTIONS OF BENZOPYRAN-2-ONE-3-CARBONYL DERIVATIVES WITH NUCLEOPHILIC REAGENTS

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(Received April 23, 1992; revised April 24, 1993)

Several benzopyran-2-one-3-carboxamides have been prepared by the condensation of coumarin 3-carbonyl chloride (I) with various nucleophilic reagents. The reaction of 3-carboethoxy coumarin with *o*-phenylene diamine and *o*-aminophenol gave 3-(benzimidazolyl) and 3-(benzoxazolyl) coumarins (XIa) and (XIc) respectively. The reaction of ω -bromo-3-acetyl coumarin with 3-cyano-4,6-dimethylpyridine-2-thiol in the presence of K_2CO_3 gave 3-[(3-amino-4,6-dimethyl-1-thio-7-azainden-2-yl) carbonyl] coumarin (XIV).

Key words: Benzopyran-2-one-3-carboxamides, Nucleophilic reagents.

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MIXED-LIGAND COMPLEXES OF TITANIUM (III), RHODIUM (III) AND PLATINUM (IV) WITH DIPHENIC ACID AND HETEROCYCLIC BASES

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(Received July 14, 1991; revised April 17, 1993)

Fifteen new mixed-ligand complexes of titanium (III), rhodium (III) and platinum (IV) with diphenic acid (DAH_2) and nitrogen-containing heterocyclic bases have been prepared. The complexes have the composition $\text{K}[\text{M}(\text{DA})_2\text{L}]$, $\text{K}_2[\text{M}(\text{DA})_2(\text{OL})]$, $[\text{Pt}(\text{DA})_2\text{L}]$ and $\text{K}[\text{Pt}(\text{DA})_2(\text{OL})]$, where $\text{M} = \text{Ti(III)}$ or Rh(III) ; DA = dianion of diphenic acid; L = 2-aminopyridine (Apy), 2,2'-bipyridine (Bipy), 2,2'-biquinoline (Biq) or 1,10-phenanthroline (Phen); OL = anion of 2-pyridinol. The complexes were characterised on the basis of elemental analyses, conductivity measurements, magnetic measurements, infra-red and electronic spectral studies. All the complexes were found to be octahedral.

Key words: Mixed-ligand complexes, Diphenic acid, Heterocyclic bases.

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CONDUCTIVITIES AND IONIC ASSOCIATION OF SODIUM PERCHLORATE AND SODIUM BENZOATE IN MIXED SOLVENT SYSTEMS AT 25°

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(Received May 11, 1992; revised March 3, 1993)

Electrolytic conductivity measurements have been made on solutions of sodium perchlorate and sodium benzoates in binary mixtures of water with methanol and acetonitrile at 25°. The limiting molar conductivities and association constants were derived from the experimental data with the Fuoss conductivity equation. Sodium benzoate has been found more associated than sodium perchlorate in both solvent systems. The results are discussed in terms of solvent effect on the conductivity parameters as the composition of water + co-solvent mixtures was varied.

Key words: Conductivity, Sodium perchlorate, Sodium benzoate.

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CHARACTERISTICS OF GLASS MAKING SANDS OF KHISORE - MARWAT RANGES OF D. I. KHAN DIVISION, N.W.F.P., PAKISTAN

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(Received November 14, 1989; revised April 27, 1993)

Extensive deposits of silica sand are found in the basal part of Dutta formation (Jurassic) in the Khisore and Marwat ranges, D.I.Khan division, NWFP. The chemical composition, grain size distribution and physical characteristic of eleven samples from these areas were determined. Beneficiation by physical and chemical methods were undertaken to reduce the colour imparting impurities mostly iron. The objectives of the work was to investigate whether the silica sand deposits of Khisore and Marwat ranges were suitable for the rapidly expanding glass industries of Pakistan. The results showed that the silica sand in its original form is not suitable for the production of colourless container glass. However, it is suitable for the production of sheet glass/green glass. After beneficiation, majority of the samples were up graded to meet the specification for the production of colourless container glass.

Key words: Glass sand, Khisore, Marwat ranges, Silica sand, Beneficiation.

Short Communication

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New Reserpine Analogues

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Biological Sciences Section

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VARIATION OF PHENOLIC COMPOUNDS IN RAPESEED VARIETIES GROWN AT PESHAWAR

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(Received March 9, 1991; revised April 19, 1993)

Total phenols, catechin, sinapine, flavan-4-ols, proanthocyanidine and procyanadine of 18 rapeseed varieties (BSA, Tobin, Salam, Marnoo, Tower, Altex, Tatyoon, PR-7, D.G.L, Toria, Raya N.S, Porbi Raya, Raya Raya, SM-83001, SM- 83000, Torch, Varuna and RD-80) collected from Peshawar were determined from methanol and methanol-HCl (1%) extract. Variations in flavan-4-ols and proanthocyanidine content were much larger among the varieties as compared to other phenolic constituents. Maximum sinapine content (0.99%) which is the major constituent of rapeseed was found in the variety RD-80 while the minimum amount (0.58%) in variety Toria. The sinapine content extractable in absolute methanol is 52.2% and that extractable in acidic methanol is 20.4% of the total phenolics. This information will serve as a guide for processing of rapeseed for animal/human nutrition.

Key words: Polyphenols, Rapeseed varieties.

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STUDIES ON THE ESSENTIAL OILS OF THE PAKISTANI SPECIES OF THE FAMILY UMBELLIFERAE

Part -LI. The Essential Oil of Bupleurum Lanceolatum Wall Seed

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(Received July 20, 1992; revised May 3, 1993)

The essential oil of *Bupleurum lanceolatum* Wall. in Pakistan was subjected to analysis by column, thin layer, gas chromatography and mass spectroscopy. Only the most abundant compounds representing Ca 83% of the oil were identified. The major components were hydrocarbon fraction (58.9%), oxygenated (24.1%), coumarins/tarry matter and others (17%). The essential oil has sweet smell and is recommended for use in perfumery.

Key words: *Bupleurum lanceolatum*, Umbelliferae, Essential oil, Geranylacetate.

Introduction

Hewlet Packard gas chromatograph was used for GC/MS

Short Communication

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**A Study on Protein Extraction and Nutritional
Evaluation of *Ulva fasciata* of Arabian Sea**

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S. HASNI*

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Short Communication

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**New Records of *Pseudopolydora* Species
(Polychaeta, Spionidae) from Pakistan**

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(Received July 29, 1991; revised April 11, 1993)

Short Communication

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**Comparative Studies on Growth and Survival
of the Larvae of Hybrids of Two Clariid
Catfish *Clarias macrocephalus* (Gunther)
x *Clarias batrachus* (Linnaeus)**

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Technology Section

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A LOW - COST PRECISION POLARIMETER

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(Received October 15, 1990; revised March 18, 1993)

Fabrication of a low-cost precision polarimeter, using locally available components, is described. The polarimeter utilizes a polarizing filter in conjunction with a typical monochromatic sodium line radiation source. The point of maximum cancellation of optical density is ascertainable both manually and electronically, with a scale readability of 0.1° . The specific rotation data determined for eight dextro- and levo-rotatory compounds are compared against those obtained by using standard, imported polarimeters, the percent error being within 0.21 - 2.0%.

Key words: Polarimeter fabrication, Low-cost polarimeter, Polarimetry.

OIL SEED PROCESSING TECHNOLOGY IN PAKISTAN

Part-V. Field Performance of the Modified Lahore Expeller

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(Received April 28, 1992 ; revised May 6, 1993)

Field performance of the traditional and the modified Lahore Expeller (4") has been comparatively evaluated. Based on data for two years on the processing of rapeseeds, it has been found that the modified expeller shows improvements over the traditional expeller in processing capacity and oil yield, 52% and 2.75% respectively. Scope for further improvements in the Lahore Expeller (4") and suggestions there of are also discussed.

Key words: Processing technology, Modified expeller, Comparative evaluation.

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OIL SEED PROCESSING TECHNOLOGY IN PAKISTAN *Part -VI. Design Improvements in Oil Expeller*

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(Received August 8, 1992; revised March 10, 1993)

Further modifications have been effected in the design of the previously modified expeller 4" (Model-1) by enlarging the screw length (from 11" to 16"), feed worm pitch and optimizing the slots of the drainage barrel (Model-2). Consequently a smooth operation of the expeller has been achieved with enhanced performance and free from the screw jamming problem. The case hardening of most wearing parts of expeller was carried out by simple pack hardening carburizing process to increase their life three times as compared to the existing practice.

Key words: Modified expeller, Drainage barrel, Case hardening, Screw assembly.

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OIL SEED PROCESSING TECHNOLOGY IN PAKISTAN
Part -VII. Operational Parameters of Expeller Model-2 (16") Under Field Trials

DIN MOHAMMAD AND SHAFIQ AHMAD KHAN

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(Received August 27, 1992)

Processing parameters of expeller Model-2 (16") on both soft and hard oil seeds have been studied under field testing/operation conditions. It has been found that the expeller performs satisfactorily on all types of seeds and maintains its claimed enhanced processing capacity and extraction efficiency under these conditions.

Key words: Expeller, Parameters, Conventional, Un-conventional.

Short Communication

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**Influence of Different Packaging Materials on
Fruit Quality of Two Date Cultivars Grown in
Faisalabad**

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(Received August 17, 1992; revised May 8, 1993)