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HALO DERIVATIVES OF 1, 10-PHENANTHROLINE

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Halogenation of 4, 7-dihydroxy-1, 10-phenanthrolin-2, 9-dione has been studied using different halogenating agents under different conditions. The halo compounds so obtained were reacted with some chemical reagents, with the purpose of establishing their compositions. The structures of all the newly obtained compounds were confirmed by elemental analysis, IR and ¹H-NMR spectroscopic studies.

Key words: 1, 10-Phenanthrolines, Halogenation, Pyridocorbostyrils.

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CONDUCTIVITIES AND IONIC ASSOCIATION OF COPPER (II) AND MANGANESE (II) SULPHATES IN METHANOL + WATER AT 298.15 K

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(Received June 7, 1993; revised November 14, 1993)

Electrolytic conductivities for copper (II) and manganese (II) sulphates in binary mixtures of methanol + water have been measured at 298.15 K. The data were analyzed with the Lee and Wheaton conductivity equation for the derivation of limiting molar conductivities and association constants. The results are compared with those in the literature pertaining to analogous media, derived conductometrically.

Key words: Copper sulphate, Manganese sulphate, Methanol + water mixtures, Conductivities.

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LEVELS OF HEAVY METALS IN OWL'S FEATHERS AND ATMOSPHERIC POLLUTION

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(Received March 28, 1993; revised November 25, 1993)

Birds feathers act as traps for toxic and heavy metals present in the atmosphere and indicate levels of pollution in the living area of the bird. Different metals (Cd, Pb, Cu, Zn, Ni and Co) have been analysed in Owl's feathers. Studies have been done concerning distribution of metals in upper and lower parts of the feather. Upper parts of feathers have higher concentrations of metals as compared to lower parts except for Zinc. Feathers of Owls caught from polluted and unpolluted areas have been analysed. Comparative studies have been done between the rain water samples and birds feathers collected from polluted and unpolluted areas. Metal ratios for polluted to unpolluted areas for rain water samples and birds feathers are in good agreement with each other. Upper half of the feather is a better indicator for atmospheric pollution than the lower half.

Key words: Heavy metals, Biomonitoring, Feathers, Owl, Voltammetry.

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DISSOLUTION OF PHOSPHORITE IN DILUTE HYDROCHLORIC ACID SOLUTION

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(Received July 13, 1992; revised December 18, 1993)

A powdered phosphorite ore was leached in dilute solutions ($0.14 - 3.15 \text{ mol l}^{-1}$) of hydrochloric acid at temperature ranging from 50 to 70° . Both phosphorus and calcium were extracted in a nearly stoichiometric ratio. The rate of extraction of both elements was controlled by diffusion of the reagent through a residual layer of non-soluble components of the phosphorite, and not by surface chemical reaction. The apparent activation energies were evaluated for both elements and results given.

Key words: Dissolution, Phosphorite, Acid.

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GC ANALYSIS OF CHLORINATED CATECHOLS IN SOILS BY INTERNAL STANDARD METHOD

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(Received June 23, 1992; revised November 22, 1993)

An improved gas chromatography (GC) analysis method was developed with seven chlorinated catechol compounds in soils. Six solvent systems were tested by a shaking method of extraction. The method include extraction, mixing with internal standard 2,6-dimethoxyphenol, then derivatization with pentafluorobenzyl bromide, cleanup by water-toluene shaking and then injected to GC. The recovery yields varied largely from 67 to 90% within six solvent systems. Two solvent system: Diethylether-hexane-acetoneheptane (3:3:2:2:) and hexane-heptane-chloroform (1:1:1:) gave the highest yields in both soils. The standard deviations and t-test were applied to the results where some significant variations were also recorded.

Key words: Chlorinated catechols, Solvent system, Internal standard, Recovery yields, Soil analysis.

FETO-MATERNAL MINERAL HOMEOSTASIS—A STUDY IN THREE PREGNANT GROUPS

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(Received June 25, 1992; revised December 11, 1993)

To assess the relationship between maternal and fetal mineral homeostasis, serum, calcium, magnesium inorganic phosphorus total protein, albumin and alkaline phosphatase concentrations in cord serum from 30 preterm 30 term and 30 term low-birth-weight neonates were compared with the maternal serum. There was a significant, relationship between the two compartment. A strong positive correlation was observed between the mineral levels of term and preterm fetomaternal compartment. No correlation was present between the mineral levels of term low birth weight group except magnesium. Results of paired t-test indicate significant differences among the mineral levels of three pregnant groups.

Key words: Calcium, Magnesium, Phosphorus, Albumin.

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STUDIES ON GERMINATING *CARUM CAPTICUM* SEED LIPIDS

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(Received August 27, 1992; revised November 18, 1993)

Studies have been carried out on germinated seeds of *Carum capticum* for the determination of different lipid classes, (8.5 - 15.0% and 12.4 - 18.2%) in cotyledons and roots respectively by the application of thin layer chromatography. Each lipid class was hydrolysed, methylated and purified consequently to find out the fatty acid composition ranging $C_{12:0}$ - $C_{20:0}$ by the use of gas liquid chromatography.

Key words: *Carum* seeds, Germination, Lipids, Fatty acids.

GREEN FORAGE YIELD, DRY MATTER YIELD AND CHEMICAL COMPOSITION OF OAT WITH ADVANCES IN MATURITY

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(Received July 13, 1992; revised December 7, 1993)

Green forage yield, dry matter yield and forage quality of oat variety S-81 as affected by different cutting treatments were determined during 1987-1989 at the National Agricultural Research Centre, Islamabad. Green forage yield, dry matter yield and crude fibre increased, while seed yield and crude protein declined with maturity. Maximum green forage and dry matter yields with considerably inferior forage quality as determined by lower crude protein and higher crude fibre values were recorded at the 50% flowering stage. Minimum green forage and dry matter yields with superior quality forage were recorded in the crop harvested at 70 and 85 days after planting. The results of this research indicate that it is possible to have a satisfactory forage and grain crop from oat which were harvested once for forage at 115 days after planting.

Key words: Oat (*Avena sativa* L.), Cutting stages, Forage yield and Quality.

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EFFECT OF TWO TILLAGE SYSTEMS ON SOIL PHYSICAL PROPERTIES, ROOT GROWTH AND THE YIELD OF RICE AND MAIZE

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(Received July 28, 1991; revised December 7, 1993)

To investigate the effect of tillage on soil physical properties and crop yield field experiments using rice and maize were carried out at the Bangladesh Agricultural University farmland during the autumn and winter seasons of 1989 and 1990. The rice cultivars BR11 and Pajam were used in the autumn season of 1989, while during the winter of 1990, BR2 rice and maize (Barnali) were cultivated. Results revealed that the bulk density values were greater due to tilling by country plough than power tiller except in the experiment with BR11 rice. Soil bulk density increased significantly with an increase of soil depth. Root density of different crops was generally greater with power tiller as compared to country plough and it decreased significantly with an increase in soil depth. There were no significant differences in rice yield and straw due to power tiller and country plough. However, maize grain yield and ear length were significantly greater with country plough as compared to power tiller.

Key words: Plough pan, Bulk density, Soil resistance.

Introduction

texture of the soil was silty loam. The particle density ranged

INTERCROPPING MAIZE WITH HIGH YIELDING UPLAND SUMMER RICE: A POTENTIAL PRACTICE FOR BANGLADESH

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(Received June 19, 1993; revised December 14, 1993)

In field trials, conducted at the Regional Research Station, Bangladesh Agricultural Research Institute (BARI), Ishurdi, Pabna during the crop seasons of 1989 and 1990, maize (*Zea mays*) inter-cropped with high yielding variety (HYV) upland summer (aus) rice (*Oryza sativa*) (cv. BR 21). The treatments included were varying levels of plant populations; sole rice (broadcast) at 100 kg seed/ha; 100% rice + 50% maize (line sowing); 100% rice + 33% maize; 75% rice + 33% maize; 50% rice + 50% maize; 100% rice + paired row maize (100%) and sole maize at 53,333 plants/ha. Highest maize yield (4.37 t/ha) was obtained from sole maize and it was followed by 100% rice + paired row maize intercrop (4.26 t/ha). This intercrop combination also produced an additional rice yield of 1 t/ha which was nearly 50% of the yield obtained from sole rice crop (2.05 t/ha). The treatment gave each of the highest rice equivalent yield (4), Land equivalent ratio (1.47), net return (US\$ 412/ha) and benefit-cost ratio (2.50).

Key words: Intercropping, Maize, Land equivalent ratio.

FREQUENCY OF PLANT PARASITIC NEMATODES IN CHINA ORANGE (*CITRUS MICROCARPA* L.) BUNGE AND THEIR CONTROL

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(Received November 5, 1992; revised December 1, 1993)

Soil samples from one hundred and thirteen plant nurseries were collected for the detection of nematodes and their population threshold in China Orange. Citrus nematodes (*Tylenchulus semipenetrans*) which cause die back disease were found in abundance in association with other pathogenic nematodes viz. *Helicotylenchus* spp., *Pratylenchus* spp., *Tylenchorhynchus* spp. and *Xiphinema* spp. Unhealthy plants were treated with Tenekil and DBCP for their comparative nematicidal study. Tenekil was found more effective.

Key words: China orange, Plant nematodes, Control.

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PERSISTENCE OF DIMETHOATE IN VEGETABLES

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(Received September 16, 1993; revised November 6, 1993)

Dimethoate in treated pumpkin is separated by thin layer chromatography using silica coated chromatoplate from coextracted materials. Spot area measurement and comparison of colour are used to give a semiquantitative determination of the amount of pesticide which persisted on the crop. The method is sensitive to detect upto 0.1 µg of dimethoate. The need for a preliminary cleanup procedure is eliminated. Residues of dimethoate in crop declined after 14 days.

Key words: Dimethoate, Vegetables, Residues, Harvest.

Introduction

process applied to extracts of kale, lettuce, strawberries, apples

Short Communication

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**Physical Characteristics of Oil from Roots and
Flowers of *Mangifera indica***

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Short Communication

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**Interaction Between Saprophytic and
Pathogenic Fungi**

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Short Communication

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The Fatty Acid Composition of *Pithecellobium dulce* Seed Oil

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Technology Section

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EXTRACTION, SPECTROSCOPIC AND COLOURING POTENTIAL STUDIES OF THE DYE IN GINGER RHIZOME (*ZINGIBER OFFICINALE*)

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(Received December 14, 1993)

The dye in the rhizome of the plant, *Zingiber officinale* was extracted quantitatively using the solid-liquid extraction method and its physico-chemical parameters as well as colouring potential studied. A lustrous, powdery brown dye melting point Ca. 88-90° of 13.90% yield was obtained. The dye was soluble in hydroxyl organic solvents and gave one homogenous component of R_f value of 0.86 on chromatographic separation and a wavelength of maximum absorption λ_{max} 420nm. The IR spectrum of the dye showed three major functional groups, of OH group with broad band absorption between 3405-3120 cm^{-1} , aliphatic or saturated C-H stretching at 2900-2880 cm^{-1} and C=O peak at 1710-1700 cm^{-1} whilst the presence of 1,4-disubstitution on benzene ring was observed at 1930-1880 cm^{-1} . Major proton absorptions on 1H -NMR were observed at 7.2 ppm, 3.9 ppm and 1.2 ppm signifying the presence of benzyl, hydroxyl and ethyl protons at these respective absorptions. The dye gave a brilliant yellow colouration of light, wash and dry ironing (pressing) ratings of 5, 3 and 4 respectively on bleached cotton fabric.

Key words: Ginger, Annatto, Lassaigne test, Mordant.