

Physical Sciences Section

Pak J Sci Ind Res 1998 **41** (2) 63-67

POTENTIAL ANTIBACTERIAL AGENTS *PART-IV*. SYNTHESIS OF NEW 1[2-PYRIMIDINO]-AMINO-METHYL BENZIMIDAZOLES AND 1,2,3 BENZOTRIAZOLES

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(Received 29 February 1997; accepted 30 July 1997)

Condensation reaction of (IS)-2(α -hydroxy ethyl) benzimidazole (I), 2-hydroxymethyl benzimidazole (II) and 1,2,3 benzotriazole (III) with pyrimidine viz: 2-aminopyrimidine (IV-a) and 4, 6-dimethyl-pyrimidine (IV-b) under the condition of Mannich reaction afforded the hitherto unreported substituted 1-aminomethyl (hydroxyalkyl) benzimidazoles and 1-aminomethyl benzotriazoles which were assigned the structures (Va-d) and (VIa-b) on the basis of their IR, ¹H-NMR and HREIMS spectral studies. Antibacterial activity was also evaluated.

Key words: Antibacterial activity, Mannich bases, Hydroxybenzimidazole.

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Key words: Antibacterial activity, Mannich bases, Hydroxybenzimidazole.

LIGAND EFFECT ON OXIDATION RATES OF CYSTEINE BY IRON (III) COMPLEXES

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(Revised 4 March 1997; accepted 21 October 1997)

Kinetics of oxidation of cysteine by iron(III). complexes of urea, $C_2O_4^{2-}$, H_2O , $-NCS^-$, CN^- , acac, phen, and EDTA were studied by stopped-flow spectrophotometry. Kinetic measurements were done at constant ionic strength in aqueous solutions at 25°C. Reaction rates were measured spectrophotometrically by following the change in the oxidizing agent concentration under pseudo-first order conditions in which the concentration of cysteine was between one and two orders of magnitudes greater than that of the iron (III) complex. The results showed that the observed rate of the redox reaction depended inversely on both the strength of the ligand in the iron (III) complex and its size.

Key words: Cysteine, Iron (III), Oxidation

EFFECT OF EPOXIDES ON ULTRAVIOLET DEGRADATION OF POLYVINYL CHLORIDE

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(Received 10 July 1997, accepted 1 December 1997)

PVC-DOP system was formulated with some prepared epoxidized vegetable oils such as epoxidized linseed and soybean oils as well as epoxidized phenolic compound such as the prepared low molecular weight bisphenol A diglycidyl ether. Ba/Pb laurate as a light stabilizer was added in low concentration. Samples without epoxidized compounds were also formulated. The formulated PVC samples with and without a light stabilizer were tested and evaluated before and after exposure to UV lamp for 6 months at 20 °C. The effect of these epoxidized compounds on colour, mechanical properties and electrical volume resistivity of PVC samples before and after exposure to UV radiation was studied. It was found that the epoxidized linseed and soybean oils were generally good both as stabilizers and plasticizers. While bisphenol A diglycidyl ether was generally a good stabilizer but poor plasticizer. The epoxidized samples were also evaluated for use in electrical insulation fields.

Key words: PVC-DOP system, Epoxidized linseed oil, Epoxidized soybean oil, Bisphenol A diglycidyl ether, Ba/Pb laurate, UV degradation.

STUDIES WITH POLYFUNCTIONALLY SUBSTITUTED HETEROAROMATIC COMPOUNDS: SYNTHESIS OF SOME NEW POLYFUNCTIONALLY SUBSTITUTED PYRIDO [3, 2-C]-PYRIDINES AND PYRIDO [2, 3-C]-PYRIDAZINES

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(Received 21 December 1994; accepted 26 December 1997)

The phenylhydrazino derivatives of ethyl acetoacetate (**1**), acetylacetonitrile (**11**) and acetylacetone (**17**) reacted with malononitrile, malononitrile dimer (**4a**) or ethyl cyanacetate dimer (**4b**). The products were treated with benzaldehyde to yield different polyfunctionally substituted pyridopyridines and pyridopyridazines.

Key words: Pyridopyridines, Pyridopyridazines, α -arylhydrazino ketones.

THE COMPLEX DIELECTRIC PROPERTIES OF PETROLEUM AND THEIR ADMIXTURES

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(Received 25 March 1997; accepted 21 January 1998)

The complex dielectric constant and the related properties of petroleum and their mixtures have been analyzed using Chelsea Dielectric Interface System, a microprocessor based Digital Dielectric Spectrometer. Frequency response curves have been drawn for the frequency range 0.1Hz-1MHz, at 303.5 °K. The real and imaginary part of dielectric constant ϵ' and ϵ'' , and dissipation loss factor ' $\tan \delta$ ' have been plotted as a function of frequency. From the study of dielectric data, a general formalism is obtained for the permittivity of mixtures as a function of measurable parameters of its mixing components.

Key words : Dielectric constant, Capacitance, Loss factor, Conductance.

Biological Sciences Section

Pak J Sci Ind Res 1998 **41** (2) 92-96

ANTIULCEROGENIC EVALUATION OF AQUEOUS EXTRACTS OF *CICHORIUM INTYBUS* AND *PHYLLANTHUS EMBLICA* IN NORMAL AND ASPIRIN-TREATED RATS

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(Received 8 January 1996; accepted 25 November 1997)

Antiulcerogenic activities of aqueous extracts of two plant drugs were studied against normal pylorus ligated and aspirin ulcerated rats. Their effect on volume of gastric juice secreted, acid output, peptic activity, mucin activity and curative ratio were recorded. The percent incidence of ulcer, average number of ulcers per stomach and ulcer index were calculated. *Cichorium intybus* showed a significant decrease in acid output and pepsin concentration in aspirin-ulcerated rats. A qualitative change in hexose and fucose concentration was found in pylorus ligated and aspirin-ulcerated rats. A 40% inhibition in ulcer formation was recorded. A significant decrease in acid output was found in animals treated with aqueous extract of *Phyllanthus emblica* in normal pylorus ligated rats but statistically non significant change in acid output was recorded in aspirin-ulcerated rats. Both normal pylorus ligated and aspirin-ulcerated rats treated with aqueous extracts of *Phyllanthus emblica* did not show any antipeptic activity. However, a significant inhibition (54%) of ulcer formation was found.

Key words: *Phyllanthus emblica*, *Cichorium intybus*, Aqueous extract, Antiulcerogenic activity.

UTILIZATION OF RAPESEED MEAL/CAKE IN POULTRY FEED I. EFFECT OF INCORPORATING 10% RAPESEED CAKE IN POULTRY DIET ON THE GROWTH AND LAYING PERFORMANCE OF BROWN-EGG-LAYER (TETRA SL)

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(Received 8 April 1997; accepted 25 November 1997)

Fifteen days old 100 chicks were divided into two groups. One group was maintained on standard diet, while the other group was fed on the diet containing 10% rapeseed cake. During 34 weeks of the experiment, rapeseed group was studied for liveability, feed consumption, laying performance and egg quality in comparison with the standard group. No adverse effect was observed rather beneficial effect was observed on the growth and laying performance at this level. Feed consumption for the period of first 6 weeks was 857g chick⁻¹ for standard group and 918g chick⁻¹ for rapeseed cake group. Live weight after 20 weeks was 1478.88g pullet⁻¹ for standard group and 1503.07 g pullet⁻¹ for rapeseed cake group. Laying record of seven weeks showed significant increase ($p<0.05$) in egg production for rapeseed cake group (72.43%) as compared with 65.58% in standard group. Egg size ranged between 56 to 59g in standard group and 54 to 60g in rapeseed cake group. Organoleptic testing revealed no differences in the overall acceptability scores which were 8 in both the cases.

Key words: Rapeseed cake, Layers, Growth, Production performance.

ENHANCED DETECTION OF NITROFURANTOIN AS A MUTAGEN BY A MUTATOR R-PLASMID

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(Received 14 January 1997; accepted 14 January 1998)

Enhanced detection of nitrofurantoin as a chemical mutagen by a novel mutator R-plasmid pEB019 isolated from clinical stool specimen was investigated using Ames reverse mutation assay. Plasmid pEB019 protected *E coli* WP₂ *trp*, WP₂ *trp uvrA*, AB1157, AB1157 *uvrA* tester strains against the bactericidal effects of nitrofurantoin. The mutagenicity assay results showed that there was no significant NFT-induced reversion in *E coli* AB1157 prototrophic strain at all concentrations used. There was however, a significant ($P < 0.01$) dose-related induced reversion mutation with strains possessing R-plasmid pEB019 and pKM101, but with the former showing a greater activity compared with pKM101. Reversions in prototrophic and auxotrophic strains, bearing R-plasmid pEB019 were about 10 fold more than the reversion in the isogenic strains without the plasmid. The possible implications of the superior mutability potential of R-plasmid pEB019 compared with pKM101 in the monitoring and detection of environmental chemical mutagens using bacterial test system are highlighted.

Key words: Mutator R-plasmid, Enhanced detection, Nitrofurantoin.

Technology Section

Pak J Sci Ind Res 1998 **41** (2) 107-110

IMPROVEMENT OF LOW GRADE JUTE FIBRE BY ENZYMATIC PRETREATMENT WITH HIGHER PIN DENSITY IN THE FINISHER CARD

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(Received 12 June 1995; accepted 25 November 1997)

Low grade jute fibres are mainly used for sacking weft batches. In processing technology these fibres draw least attention of the millers. In the present work enzymes were used to improve the softening of hard fibres for further processing. The enzymes were extracted by fermenting indigenous wheat bran as substrate with the fungi, *Aspergillus* spp. The carding effect was improved by introducing higher pin density at the sacking finisher card. By pretreatment with *A terreus* enzyme, 36.37% jute cutting was used in hessian weft batch which reduced the batch cost without impairing yarn quality and production efficiency. Moreover, the use of modified finisher card improved the yarn quality of both, the enzyme treated and untreated batches.

Key words: Jute, Xylanase, Carding.

DETERMINATION OF SORPTION-ISOTHERMS IN FOOD

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(Received 20 March 1997; accepted 11 December 1997)

Water activity (a_w) in food at known moisture content can be determined by instruments or determination of moisture content and equilibration against saturated salt solution in conventional desiccator. However, in these methods equilibration takes a long time, depending upon food composition. In this work a simple and inexpensive method has been developed to obtain sorption-isotherm in short time for determining a_w of a food. A small plastic cup was chosen (7cm/3cm) as a vessel. A weighed food in small glass beaker was rested on plastic stand in the vessel containing saturated salt solution 1/3 of its volume. The vessel was cap-closed and airtight. This technique was used for determination of a_w of dehydrated banana chips and equilibration was reached in 2 days which otherwise required 20 days for the conventional desiccator.

Key words: Modified method, Water activity (a_w), Banana chips.
