ISSN 0030 - 9885
Coden: PSIRAA 35 (6) 213–260 (1992)

PAKISTAN JOURNAL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Vol. 35, No. 6, June 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, no. 6, June 1992

TRIAZOLE - PYRAZOLE COMPOUNDS WITH POSSIBLE BIOLOGICAL ACTIVITY
Part –I. Synthesis and Spectra

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(Received October 20, 1991; revised March 26, 1992)

Condensation of the new chalcones (1) with different arylhydrazines, leads either to hydrazones (3) or pyrazolines (4) depending upon the reaction condition. Oxidation of (4) with bromine water affords pyrazole derivatives (5). Reaction of (4) and (5) with isothiocyanate derivatives leads to thioureas (6 and 7). Cyclization of (6 and 7) with ethyl bromoacetate affords the corresponding thiazolidine derivatives (8 and 9).

Key words: Triazoles, Chalcones, Pyrazoles.

Pak. j. sci. ind. res., vol. 35, no. 6, June 1992

INTRACRYSTALLINE SITE PREFERENCE OF HYDROGEN ISOTOPES IN THE WATER OF CRYSTALLIZATION OF NICKEL SULFATE HEPTAHYDRATE

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(Received March 7, 1992)

The difference in hydrogen isotope distribution in different sites of the water of crystallization of $NiSO_4 . 7H_2O$ (the site preference) was determined. Six molecules of the water of crystallization are in the co-ordination sphere of nickel ion (site A), while the remaining one is bonded to sulfate ion through hydrogen bonding (site B). $NiSO_4 . 7H_2O$ was dehydrated fractionally in vacuum at 0°, and the isotopic ratio and the quantity of water for each fraction was measured. The rate process of dehydration was elucidated. The following results are obtained: (i) The dehydration is presented by the three zeroth-order rate processes which have different rate constants of dehydration. (ii) Two maxima exist in the isotopic ratio in the dehydration range, F<0.710. The site preference of hydrogen isotopes ($\delta D\%_0$) was concluded to be -20 for site A and +98 for site B, where the δD value was referred to the isotopic ratio of the mother liquor from which the crystal was grown.

Key words : Fractional dehydration, Fractional factor, Site preference.

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USE OF N-PHENYL-2-AMINO-4H-3, 1-BENZOXAZIN-4-ONE IN THE SYNTHESIS OF HETROCYCLES AND THEIR DERIVATIVES

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(Received February 3, 1992)

5-(N-phenyl-2-aminoquinazoline-4-yloxomethyl)-1,2,4- triazole-3-thiol (4) was prepared via alkylation of N-phenyl-2- amino-4(3H)-quinazolone (2) with ethylchloro acetate yielding 4- carbethoxymethoxy-N-phenyl-2-aminoquinazolone (3), followed by condensation of 3 with thiosemicarbazide. Compound 4 reacts as a thiol with nitrogen nucleophiles, alkylation and activated olefinic compounds to yield the 5-substituted -1,2,4-triazole-3N- substituted-amino derivative (5a,b), the 5-substituted 1,2,4- triazole-3-ylthioalkyl (8a,b) and the Mickael a ducts (11, 12). Treatment of 4 and 5 a,b with aromatic aldehydes yielded α- arylidene-5-substituted-1,2,4-triazole-3-thiol (9a,b), 5- substituted -1H-3-arylidenehydrazino-1,2,4-triazole (6 a,b) and N- (β-cyano-3-nitrocinnamoyl)-N`-(5-substituted-1,2,4-triazole-3- .yl)-hydrazine (7).

Key words. Synthesis, Reactions, Triazole thiol.

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ELECTRONIC ABSORPTION SPECTRA OF SOME 2, 5-DIALKYLAMINO-3, 6- DIBROMO-1, 4-BENZOQUINONE COMPOUNDS IN DIFFERENT ORGANIC SOLVENTS

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(Received May 23, 1991; revised May 20,1992)

The UV-Visible spectra of 2, 5-diethylamino-(I_a), 2, 5-di (β-hydroxyethylamino)- (I_b), 2, 5-dibutylamino-(I_c), and 2,5- dibenzylamino-(I_d)3, 6-dibromo-1, 4-benzoquinone were studied in ethanol, methanol, dioxane and chloroform. It is found that the high solvent polarity of ethanol and methanol plays no significant role on the quinonoid band position of the compound I_a and I_d. The charge transfer band of 2,5-dialkylamino substituent of the four compounds is blue shifted with increasing polarities of the solvent.

Key words: Electronic spectra, Benzoquinone derivatives, Solvent effect, UV study.

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CATION CATALYTIC EFFECTS FOR THE IONIC REACTION BETWEEN 2, 3-DIBROMOSUCCINATE AND HYDROXIDE IONS

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(Received July 21, 1991)

The second order reaction between 2, 3-dibromosuccinate and hydroxide ions was studied in the presence of inert electrolytes containing monovalent cations such as sodium nitrate and potassium nitrate. The kinetics of the reaction was studied at five different temperatures ranging from 25–45° and at various ionic strengths ranging from 1.4×10^{-2} -51.4×10^{-2} mol. dm^{-3}. Positive salt effect was observed. Cation catalytic effects on activation parameters as a function of ionic strength (μ) were studied. Temperature coefficients of the rate constants were also calculated and found to be unaffected due to the addition of electrolytes.

Key words: Ionic strength, Activation energy, Temperature coefficient.

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SOME ASPECTS OF MASS TRANSFER INTO SINGLE DROPS IN VANADIUM (IV)/DI - 2 ETHYL HEXYL PHOSPHATE SYSTEM

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(Received May 5, 1990; revised July 5, 1992)

A kinetic study using the single drop technique was made of the vanadium (IV)/di-2 ethyl hexylphosphate (D2EHPA) system. Drops of the extractant in *n*-hexane diluent were made to rise through a continuum of vanadium (IV) in acid sulphate medium. The experimental data on mass transfer were tested against theoretically predicted mass transfer model equations for both stagnant and oscillating drops. The results showed that at the operating conditions, the data conformed more closely but not exactly with that of the stagnant drop model, a situation that would tend to lower the rate of mass transfer.

Key words: Single drops, Vanadium(IV)Di system, Mass transfer model.

Short Communication

Pak. j. sci. ind. res., vol. 35, no. 6, June 1992

Pharmacokinetics of Chloroquine in Rabbit: Effect of Fasting

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(Received April 29, 1991; revised July 5, 1992)

Chloroquine is an important drug in the tropics and sub-

Biological Sciences Section

Pak. j. sci. ind. res., vol. 35, no. 6, June 1992

A NEW SPECIES OF *TABANUS* (DIPTERA:TABANIDAE) FROM PAKISTAN

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(Received December 30, 1990; revised July 6, 1992)

A new species belonging to Tabanidae, *Tabanus skarduensis* sp. n. is described and illustrated based on the specimens collected from Skardu, Northern areas of Pakistan.

Key words: Tabanids, Pakistan, New species.

Pak. j. sci. ind. res., vol. 35, no. 6, June 1992

ANTIFUNGAL ACTIVITY BY LEMONGRASS ESSENTIAL OILS

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(Received April 2, 1991; revised July 9, 1992)

The inhibitory effect of lemongrass (*Cymbopogon flexuosus*, N.O. Graminae) essential oil, isolated from local and Thai cultivars, against pathogenic fungi has been studied. The antifungal activity has been compared with that of common antimycotic agents. The oils were first screened by disc diffusion method, and then the active concentration was calculated by flask culture method. No significant difference in the activity of local and Thai cultivars was found, although a two years old local oil showed the maximum inhibitory effect. It completely inhibited the growth of *Monilia sitophilia* at 500 ppm, *Penicillium digitatum* at 1000 ppm, *Aspergillus parasiticus* at 1500 ppm, *A. niger* and *A. fumigatus* at 2000 ppm.

Key words: *Cymbopogon flexuosus,* Essential oil, Antifungal, Lemongrass.

Technology Section

Pak. j. sci. ind. res., vol. 35, no. 6, June 1992

DEVELOPMENT OF PASTEURIZED BANANA MILK-BASED BEVERAGES USING COW AND BUFFALO MILK

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(Received November 10, 1991; revised July 29, 1992)

By using cow and buffalo milks 24 different formulations of banana milk beverages were prepared. The amount of banana pulp and stabilizers was varied, beverages were pasteurized at 80°, bottled, and cold stored at 4-8°. After preliminary sensory evaluation, the first-higher eight formulations were again manufactured for further study, and to determine shelf life under cold storage conditions. On comparison, it was found that buffalo milk based beverages were liked more by the people of Pakistan. The reason seemed to be the palate and taste of the people of the subcontinent for the buffalo milk rather than the cow milk. For manufacturing such beverages, Grindsted's Mexpectin RS-450 as well as Grindsted's Gelodan S.M. can be used @ 0.15 or 0.20% but more viscous beverages secured higher scores, and Mexpectin had an edge over the Gelodan. Due to the use of potassium sorbate in the formulations and cold storage, the bottled beverages gave shelf life of one month.

Key words: Banana milk beverages, Cow and buffalo milk.

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BENEFICIATION OF TARLI-DOMEL (AZAD KASHMIR) GRAPHITE ORE

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(Received January 7, 1992; revised June 28, 1992)

A study was undertaken to beneficiate a low grade graphite ore from Tarli Domel area of Azad Kashmir. The ore, initially containing 8-9% graphitic carbon, was upgraded by flotation to a concentrate assaying 86-87% graphitic carbon with a recovery of 97%. This paper deals with the optimization of various parameters for achieving the said grade and recovery.

Key words: Graphite, Beneficiation, Flotation, Regrinding.

Short Communication

Pak. j. sci. ind. res., vol. 35, no. 6, June 1992

Preparation of Ferrous Sulfate from Iron Rolling Scale

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(Received February 1, 1992; revised June 29, 1992)