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Physical Sciences Section

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EFFECT OF CATIONS INTRODUCED INTO 12-MOLYBDOPHOSPHORIC ACID ON ITS CATALYTIC PROPERTIES IN DEHYDRATION OF 2-PROPANOL II. Na^{+1} - AND Zn^{2+} - SALTS

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The effect of the type and amount of cations introduced into 12-molybdophosphoric acid on its function as an acid-catalyst was studied for the conversion of 2-propanol under atmospheric pressure and at 300°. Thermal studies revealed that molybdophosphates lose a large part of its water content at about 250° and their decomposition begin around 500°. It was found that the salts are more active than the free acid and the dehydration reaction is more favourable than the dehydrogenation. Propylene is the most selective product whereas both ether and acetone were produced in low quantities.

Key words: Conversion,2-Propanol, Molybdophosphoric

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ORGANIC REACTIONS IN THE AQUEOUS MEDIUM
Part VI. Synthesis of Substituted Pyrazoles and Pyrazolones

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The reactions of semicarbazide hydrochloride and hydrazine monohydrate with ethyl acetoacetate, acetylacetone, benzoylacetone and dibenzoylmethane leading to the formation of pyrazole and pyrazolone derivatives have been intensively studied in the aqueous as well as in the nonaqueous medium under various sets of conditions. This has resulted in the development of simple and convenient methods for the synthesis of pure ethyl acetoacetate semicarbazone (I), 3-methylpyrazol-5-one-1-carboxamide (II), 3-methylpyrazol-5-one (III), 3, 5-dimethylpyrazol-1-carboxamide (V), 3, 5-dimethylpyrazole (VI), 3-phenyl-5-methylpyrazole-1-carboxamide (VII), 3-phenyl-5-methylpyrazole (VIII) and 3, 5-diphenylpyrazole (IX). It has been suggested that the reaction of semicarbazide hydrochloride with β-diketo compounds proceeds through four stages. A reaction scheme has been proposed to explain the formation of different products.

Key words. Synthesis, Pyrazole and Pyrazolone derivatives.

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FORMATION OF IRON GALLIC ACID COMPLEXES AT DIFFERENT pH AND DETERMINATION OF THEIR STABILITY CONSTANTS

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(Received January 13, 1992; revised May 11, 1993)

The stability constants of ferric complexes with 3, 4, 5, trihydroxy benzoic acid have been determined. This simple ligand was used as model of the catechol containing iron transport compounds (siderophores) found in micro-organism having very high stability constant values with ferric ion some time up to 10^{45}. The metal to ligand molar ratio is totally pH dependent. The stepwise formation constant Kn of the iron gallate reported in this paper are defined as [MLn]/[MLn-1][L]. Where [L] is the concentration of deprotonated catechol ligand. The species observed during iron gallate formation were ML, ML_2 and ML_3. The log K values calculated for these from their spectrum are $\log K_1$=14, $\log K_2$=8.5 and $\log K_3$=5. It shows that over all formation constant is nearly 10^{28}.

Key words: Iron, Gallic acid, Stability constant.

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POTENTIAL ENERGY CALCULATIONS OF METHYL α - THIOMALTOSIDE "$C_{13}H_{24}O_{10}S$"

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(Received September 17, 1990; revised September 9, 1993)

During the course of present work potential energy calculations are carried out to find the bonded and non bonded interactions in the structure of methyl α - thiomaltoside. The possible allowed conformations of O_6 - O'_6 are found to be in the region of ϕ =O° to 360° and ϕ' = 0° to 230°,ϕ = 40°to 310° and ϕ = 230° to 360° respectively (ϕ and ϕ' are the angles of rotation about the bond C_5 - C_6 and C'_5 - C'_6, respectively). The hydrogen bonds for the pair O_6 - O'_6 are located at the following values of ϕ andϕ'; (I). ϕ=40°, ϕ =260°; (II). ϕ=310°, ϕ'=300°; (III). ϕ'=310°, ϕ'=310°; (IV). ϕ =340°and ϕ'=340°. The distance between the two atoms is 2.70 A° for the above values.

Key words: Methyl α - thiomaltoside.

Biological Sciences Section

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PROTEIN, AMINO ACID AND MINERAL COMPOSITION OF SOME CULTIVARS OF BREAD WHEAT

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(Received March 15, 1993; revised September 9, 1993)

Total protein, amino acids and Ca, Zn, Cu, Fe, Na and Mg contents were determined in eight selected cultivars of bread wheat, *Triticum aestivum* (AABBDD, 2n = 6x = 42) and compared with their respective mutants. The material exhibited pronounced genetic variability in protein content and quality. Some mutants were found to differ significantly from the parent cultivars in their amino acids and mineral compositions. Enhanced production of essential amino acids such as lysine, threonine, valine, metheonine, leucine and isoleucine, were found in some wheat mutants. A mutant, M-11 has been identified with significantly higher ($P < 0.05$) proline value than its mother cultivar C- 591. The present study shows that induced mutations can be utilized for alteration / enhancement of amino acids and mineral composition of cereals.

Key words: Protein, Amino acid, Wheat.

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VARIETAL RESPONSE OF WHEAT TO WATER STRESS AT DIFFERENT GROWTH STAGES. EFFECT ON TILLERS PRODUCTION

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(Received February 22, 1992; revised October 14, 1993)

Three varieties of wheat viz: Pak 81, Punjab 85 and Kohinoor were subjected to low water stress (-10 bars on leaf water potential basis) at tillering, jointing, boot and anthesis. Crop was sown in a split plot design. Water potential of the central leaves was determined on alternate day using Pressure Bomb till the desired level of -10 bars was achieved. At this stage water stress was terminated by applying 7.5 hectare centimeter water by calibrated buckets. Stressed plots were protected from rain water by polyethylene sheets placed over iron frames when needed. Results of the 2 years data revealed that number of spike bearing tillers per unit area was significantly reduced by water stress. The effect was more pronounced in plants stressed at jointing. Kohinoor produced significantly more number of spike bearing tillers per unit area than Pak 81 and Punjab 85. However, Pak 81 and Punjab 85 were found sensitive to water stress at jointing stage and Kohinoor at tillering stage of growth.

Key words: Wheat tillers, Water stress and leaf water potential.

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FIRST SUCCESSFUL INOCULATION OF *ARTEMIA* AND PRODUCTION OF CYSTS IN THE COASTAL SALTPANS OF BANGLADESH

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(Received December 17, 1992; revised September 25, 1993)

Two experiments were made to introduce production of *Artemia* cysts in the coastal saltpans of Bangladesh. The second attempt gave success for the first time in this country to produce *Artemia* cysts in the coastal saltpans as a byproduct of salt extraction. Field experiment was done between Dec. 1988 and Mar. 1989 on a small plot of land ($1000m^2$) at Chanua, Banskhali. A total of 517g (dry weight) of cysts and 2.6 tons of salt; i.e. 2.10 kg of dry cysts and 10.83 tons of salt/ha/month were produced.

Key words: *Artemia*, Cyst production, Saltpans.

Short Communication

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A Glance at the Medicinal Plants of the Northern Area in the Himalayan Region

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Short Communication

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Serotypes of *Bacillus thuringiensis* in Pakistan

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Technology Section

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OILSEED PROCESSING TECHNOLOGY IN PAKISTAN
Part X. Small-Scale Dehulling and Processing of Sunflower

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(Received August 22, 1993)

A technology system for the processing of sunflower seeds at the village (small scale) level has been studied. The system studied combined the use of an imported dehuller and the previously modified oil expeller. Details of the expelling characteristics of the undecorticated and partially decorticated sunflower seeds and their effect on oil yield are discussed.

Key

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Key words: Sunflower, Oil expeller, Seed.