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Physical Sciences Section

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EXACT ENUMERATIONS AND MONTE CARLO SAMPLING OF SELF-AVOIDING RANDOM WALKS

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(Received January 5, 1978)

Abstract. Two methods for the computer based enumerations of self-avoiding random walks according to their order are described. One is an exact enumeration method and the other is a Monte Carlo method based on the 'slithering snake' technique of Wall and Mandel. It is suggested that such a classification of random walks according to their order helps in the study of polymers in different solvents.

ANTIVIRAL AGENTS

Part I. Indoles as Analogues of 2- (α -Hydroxybenzyl) benzimidazole

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Abstract. The synthesis and antiviral screening results of substituted indoles as analogues of 2-(α -hydroxybenzyl) benzimidazole have been described. Two of the compounds tested showed antiviral activity against two of the viruses used for screening.

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A SIMPLER AND HIGH-YIELD SYNTHESIS OF 6-NITROVANILLIN

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(Received December 26, 1977)

Abstract. 6-Nitropiperonal with sodium methoxide in dry methanol gives 6-nitrovanillin in 75% yield.

SYNTHESIS OF HETEROBICYCLIC COMPOUNDS

Part V. Formation of 4,5-dioxopyridino-(3,4-e)(1,3)-oxazines*

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(Received March 24, 1977)

Abstract. 1-Substituted -1,2-dihydropyridinodioxines (1) with one molecule of alkylamine (2) yield in general 3-substituted derivatives of 2,2-dimethyl-4,5-dioxo-2,3,5,6-tetrahydropyridino-(3,4-e)(1,3)-oxazine system (3) quantitatively. The products (3A) are very stable to acidic and basic reagents but methoxide in methanol degraded (3) R=Ph; R'=Et) diagnostically first to an amide (4) and then to the pyridone ester (5). The latter was prepared authentically from a known route. IR and UV spectra have also been recorded in support of structure 3A.

QUANTITATIVE DIMENSIONAL CHARACTERIZATION OF POLYMER SINGLE
CRYSTALS FROM THEIR LIGHT SCATTERING IN STREAMING SYSTEMS

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(Received March 8, 1977)

Abstract. Light scattering by nonspherical particles which are oriented by streaming furnishes a method for investigating the size and shape of the scattering materials [1-4]. A new experimental technique used for this investigation is the measurement of the change in the intensity of the light scattered by polymer single crystals when they are oriented by a velocity gradient. The systems investigated consist of suspension of polymer single crystals of polyethylene. The estimated lengths are found to be within the range of the expected value as determined independently by electron microscopy.

THE ALKALINE HYDROLYSIS OF METHYL-SUBSTITUTED ARYL PHOSPHATES

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(Received January 7, 1978,; revised March 6, 1978)

Abstract. The rates of $S_N2(P)$ reactions in the alkaline hydrolysis of a series of methylaryl phosphates with varying leaving groups have been measured in water at 39° and a constant ionic strength of 1.0. Logarithmic plot of the rate constants against the pK_a 's of the leaving groups is linear with a slope of -0.70 . Kinetic isotope effect and activation parameters are consistent with the bimolecular nucleophilic displacement mechanism.

ELECTROLYTIC STUDIES WITH 2-HYDROXYCYCLOHEXANE ACETIC ACID

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(Received July 7, 1977)

Abstract. It has been shown that in the electrolysis of 2-hydroxycyclohexane acetic acid, apart from the expected diol and hept-6-enal (the product expected on the basis of Corey's [1] work), two other products namely 2-methylcyclohexanone and hept-6-enol, are also formed. Thus it appears that the reaction described by Corey is in fact more complicated than has been previously realised.

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**A CONVENIENT METHOD FOR SYNTHESIS OF
3,4,5-TRICHLORO-PYRIDAZINE**

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(Received May 9, 1977)

A solution of diazomethane [9] (0.052 mole in 100 ml ether) was added dropwise, at room temperature, to a magnetically stirred solution of tetracyclopropene [10,11] (from 8.9 g, 0.05 mole, in 100 ml ether) over a period of 30 min. The solid mass, obtained after the removal of ether on a rotary evaporator at room temperature, on washing with petroleum ether (30-40°) yielded 6.5 g (70%) of 3,4,5-trichloropyridazine mp 55-56° (lit. [5] mp for the crude product 51-53°). A sample purified by sublimation had mp 61°. Structural evidences were obtained by spectral data.

We have also observed that solutions of 3,4,5-trichloro-

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**SYNTHESIS OF 2-HYDROXY-2-PHENYL-1,2,3,4,6,
7-HEXAHYDRO-11, bH-BENZO (a) QUINOLIZINE
AND 2-PHENYL-1,2,3,4,6,7-TETRAHYDRO-11,
bH-BENZO (a) QUINOLIZINE**

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Rawalpindi

(Received September 12, 1977; revised November 6, 1977)

Short Communication

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**CHEMICAL INVESTIGATION OF
BERBERIS ZEBILIANA**

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STUDIES ON NECTRIA GALLIGENA BRES.

Part 1. The Effect of Temperature, Light and Media on Growth and Sporulation

A.J. AL-ZARARI

Department of Plant Protection, College of Agriculture and Forestry,
University of Mosul, Hammam Al-Alil, Iraq

(Received August 6, 1977; revised October 17, 1977)

Abstract. The response of *Nectria galligena* Bres. to different temperatures, light and media on growth and sporulation was determined. Maximum growth occurred at 15 and 20 while at 4, 10 and 30° very little growth was observed. Growth at 25° was of intermediate order. Sporulation did not occur under continuous darkness on any media. Spores were produced on PDA and MA under continuous light conditions and higher number of spores were produced on PDA. Sporulation also occurred when the fungus was exposed to 15 hr of light and 9 hr of dark conditions. The amount of spore production and septation of spores varied on different media. Maximum number of spores were obtained on PDA but mostly with one septum while on SEA minimum number of spores were produced but mostly with five septa. Spore production seems to be stimulated by light. Significant difference was observed on the growth of the fungus in different media. Growth was maximum in WOA and minimum in SEA while on PDA and MA it was of intermediate order.

STUDIES ON NECTRIA GALLIGENA BRES.

Part II. Bacterial Association

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University of Mosul, Hammam Al-Alil, Iraq,

(Received October 30, 1977; revised March 22, 1978)

Abstract. Lytic phenomenon in the fungus *Nectria galligena* Bres. caused by bacteria has been observed for the first time. Various media have been used for the isolation of the fungus and bacteria in pure culture. It was observed that the bacteria lived in close association with the fungus and was difficult to separate.

**SOME ASPECTS OF THE MORPHOLOGY OF *CATACANTHUS INCARNATUS*
(DRURY) (PENTATOMIDAE: PENTATOMINAE) WITH
PHYLOGENETIC CONSIDERATIONS**

IMTIAZ AHMAD AND MOHAMMAD AFZAL

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(Received August 22, 1977)

Abstract. The external morphology of the metathoracic scent gland ostioles, male and female genitalia, the alimentary, male and female reproductive organs and the scent and salivary apparatus in *Catacanthus incarnatus* (Drury) are studied. The results are compared with those in other pentatomines reported in the literature to-date and the systematic position of the taxon is briefly discussed. The resurrection of the tribe Catacanthini Stål within the subfamily Pentatominae Amyot et Serville is supported.

Technology Section

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NEW POSSIBLE INDIGENOUS SOURCE OF FAT [1]

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(Received October 27, 1977)

Abstract. Chemical properties of seed-coat fat of *Sapium sabiferum* have been compared with those of 'dalda ghee' and corn oil. The analytical results of seed-coat fat compare reasonably well with those of two edible fats under investigation. Determination of its fatty acid composition has shown that palmitic, oleic and stearic acid are the major components.

SOLUBILITIES OF R_2O_3 OXIDES IN PERICLASE AND MONTICELLITE SYSTEMS

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(Received February 23, 1976)

Abstract. The solubility relationships of various R_2O_3 oxides in periclase in ternary systems at 1600–1700°C have been determined. Neither the X-ray powder method nor reflected light microscopy was found suitable for fixing the solubility boundaries. The presence of monticellite which is molten at experimental temperatures, however, produced so much grain growth that micrograph was used successfully to plot the projections of the solubility boundaries in MgO-monticellite- R_2O_3 systems.

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ZINC - MANGANESE INTERRELATIONS
IN CALCAREOUS SOILS

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**ZINC - COPPER INTERRELATIONS IN
CALCAREOUS SOILS**

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**APPROPRIATE TECHNOLOGY FOR PRESERVATION OF FOOD IN
UNSEALED COVERED CONTAINERS**

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(Received February 18, 1978)