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TEMPERATURE DERIVATIVES OF VISCOSITY, DENSITY AND REFRACTIVE INDEX FOR THE WATER-ETHANOL SYSTEM

Part II.—Further Measurements on the Activation Energy of Viscous Flow for Aqueous Ethanol in the Concentration Range of 0 to 5%

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A detailed examination of the concentration dependence of the jumps in E_η for several aqueous solutions from 0% to 5% ethanol is undertaken at increments of nearly 0.9% ethanol. E_η is obtained by using the Andrade equation after differentiation, viz.

$$E_\eta/R = \Delta \ln \eta / \Delta \left(\frac{1}{T} \right) = -T^2 \Delta \ln \eta / \Delta T$$

For studying the course of the movements of these energy jumps as a function of alcohol concentration, a chart is prepared for the various energy jumps, which are classified as large, medium or small compared to mean value of $(\Delta E/R)/1000=0.07$. The shifts of these jumps with the concentration changes are mostly smooth, in agreement with the ideas advanced earlier, but there is evidence for branching of these discontinuities into pairs at certain alcohol concentrations. This is accompanied by appearance and disappearance of certain jumps, so that in these regions the detailed chart looks substantially different from the earlier one based on data at interval of about 2% ethanol.

MOLECULAR COMPLEXES OF PICRIC ACID WITH AROMATIC HYDROCARBONS AND THEIR DERIVATIVES

203

Part II.—Association Constants of 1:1 Complexes of Polynuclear Aromatic Hydrocarbons and Picric Acid

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In part I of this paper¹ the author has described the formation of complexes of picric acid with few mono-substituted naphthalenes and has discussed the stability of complexes and the nature of complexation. The work is further continued selecting a few polynuclear hydrocarbons *viz.* naphthalene, anthracene, fluorine, phenanthrene, pyrene, stilbene and acenaphthene, and complexes of these with picric acid are studied in chloroform solution at 18°C. and 27°C. The data collected is used to examine the factors governing the stability of complexes and the extent of the magnitude of the binding force between the components.

KINETICS OF HYDROLYSIS OF ESTERS

Part I.

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(Received March 13, 1965)

The neutral hydrolysis of methyl and ethyl formate was studied and the reaction was found to follow first order kinetics.

It is shown that the non-exponential factor of the Arrhenius equation as well as the activation energy decreases upon passing from methyl to ethyl formate.

STUDIES IN THE ALKALOIDS OF *RAUWOLFIA CAFFRA* SONDER

Part II.—Sodium Borohydride Reduction of Raucaffricine and Perakine. Conversion of Perakine into 3, 13-di (hydroxymethyl)-4 methyl 1, 2,3,4,6,7,12,12b-octahydro-2,6 Methano Indolo [2,3-a] Quinolizine.

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Raucaffricine and perakine, the two indolenine bases of *Rauwolfia caffra* Sonder, are converted to indole bases on reduction with sodium borohydride. Perakine, under similar conditions, yields 3, 13-di (hydroxymethyl)-4-methyl, 1,2,3,4,6,7,12,12b-octahydro-2, 6-methano-indolo [2,3-a] quinolizine*. Raucaffricine under mild alkaline condition undergoes a similar type of transformation without hydrolysis of its ester group. Raucaffricine has been correlated with N α -demethyl- Δ^1 -deoxyajmaline 17-O-acetate.

CHEMICAL INVESTIGATIONS ON SKIMMIA LAUREOLA SEEDS

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Skimmia laureola (N.O. Rutaceae) seeds have been analysed for their oil and protein constituents. The oil has been shown to contain palmitic (8.28%), stearic (1.47%), palmitoleic (2.57%), oleic (33.40%), linoleic (31.15%) and linolenic acid (23.12%) and the proteins are constituted of aspartic acid, arginine, alanine, glutamic acid, glycine, leucine, isoleucine, lysine, proline, methionine, serine and threonine. The presence of pelargonin and an alkaloid, possibly skimmianine in the seeds, is also indicated.

SOME ALKYLATION REACTIONS OF MANNICH BASES IN AQUEOUS MEDIUM

Part I.— Reactions of Phenyl- β -dimethylaminoethylketone and its Hydrochloride

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(Received January 18, 1966)

Alkylation reactions of the Mannich base: phenyl- β -dimethylaminoethylketone with indole, 2-methyl-indole, pyrrole, piperidine, piperazine, nitromethane and malononitrile in aqueous medium have been described.

SOLVENT EXTRACTION OF ANTIMONY (III) FROM CHLORIDE SOLUTIONS WITH TRI-*n*-BUTYL PHOSPHATE (TBP)

Part II.—Extraction of Macro-Amounts from Ammonium Chloride and Lithium Chloride Solutions

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From ammonium chloride solutions, macro-amounts of antimony (III) is extracted into TBP as $\text{SbCl}_3 \cdot 2 \text{ TBP} \cdot (\text{H}_2\text{O})_x$, while from lithium chloride solutions extraction occurs through the formation of $2 \text{ LiCl} \cdot \text{SbCl}_3 \cdot 2 \text{ TBP} \cdot (\text{H}_2\text{O})_n$, where *n* may assume different values depending on TBP concentration in the organic phase. In both the systems initial distribution equilibrium is very rapidly established but is followed by slow hydrolysis of antimony(III) which, however, is much reduced in the latter system.

A STUDY OF A HIGH ALUMINA CLAY FROM MUSAKHEL

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A high alumina clay from Musakhel has been studied for its physico-ceramic properties alongwith the identification of the associated minerals by X-Ray and D.T.A methods. The deposit has been found to contain aluminite, alunite, boehmite and diaspore besides other minerals usually associated with kaolinite. The probable genesis of the deposit has also been discussed.

The results of this investigation show that this clay is the richest of all the clays so far reported to occur in Pakistan in respect of its alumina content of 66.3% (fired basis), thus making it suitable for the manufacture of high alumina and mullite refractories.

MOULDING CHARACTERISTICS OF MIANWALI SAND

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An attempt has been made to study the suitability of Mianwali sand for light and medium castings. The study includes the complete evaluation and the moulding characteristics of the sand.

EXTRACTABILITY OF PROTEINS FROM VARIOUS LEAVES

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Extracts from fresh leaves of 25 plants were made by mincing the leaves and squeezing the resultant pulp through double fold muslin cloth. Proteinous and non-proteinous nitrogen present in the juice was estimated. Dry matter and total nitrogen of original pulp and the fibre left after three successive extractions of protein was calculated. The results show that leaves of Leguminous and cruciferous plants are better source of easily extractable protein and most of the protein present could be extracted in the first two extractions. The leaves of some plants were mucilagenous which caused an inadequate extraction of the juice. The extractability of protein from leaves with low pH decreased. However, increase in pH 6.5-8.0 helped in the recovery of the non-extractable protein.

STUDIES ON INDIGENOUS STARCHES OF PAKISTAN

Part V.—Distribution of Amylose and Amylopectin Fractions in the Starches of Red-Skin and White-Skin Varieties of Potatoes

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(Received April 26, 1965)

The change in the size of the starch granules of white-skin and red-skin varieties of potatoes and the distribution of amylose and amylopectin in the structural units of their starches with respect to the growth of the above potatoes have been investigated. It has been observed that with the increase of the size of the potatoes from 1 to 2.5 cm. the average diameter of the starch granules in case of red-skin variety increased from 20.4 to 39.8 μ whereas in case of the white-skin variety this remains within a small range of 20.1 to 24.9 μ . Regarding the distribution of amylose fraction it was also observed that this decreased from 27.74 to 24.68 percent in case of red-skin variety but remains almost constant at the level of 24.32 percent in case of white-skin variety when both are studied with respect to the increase of the size of the potatoes.

BIOCHEMICAL AND NUTRITIONAL INVESTIGATIONS ON RICE AND RICE PRODUCTS OF EAST PAKISTAN

Part V.—Differential Spectrophotometric Investigation on the Iodine Complex Formed with the different Varieties of Raw and Parboiled Rice Starches

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(Received March 16, 1965)

The spectrophotometric study of the starch-iodine complex of seventeen varieties of raw and parboiled starch has been carried out within the range of wave length from 400 m. μ . to 650 m. μ . In case of raw-rice starch the λ_{\max} was noted in the range of 570 to 610 m. μ . Due to parboiling treatment in eleven varieties of paddy, depression of λ_{\max} by 10-30 m. μ . accompanied by increase of percent transmission was noted and this was ascribed to partial conversion of amylose to amylopectin by attachment of some branches. In other six varieties a decrease of percent transmission without any shift of λ_{\max} was noted and this was ascribed to partial debranching of some amylopectin fraction. The probable enzymes involved in the process have been discussed.

**CONVERSION OF DDT INTO DDE BY THE LARVAE OF AEDES AEGYPTI (L.) STRAIN
PCSIR. DIPTERA—CULICIDAE**

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(Received April 16, 1965)

Different strains of *Aedes aegypti* are known to convert DDT into lower homologue DDE. studies were made to assess how much known amount of DDT is converted into DDE by *Aedes aegypti* strain PCSIR Karachi. Third or fourth instar larvae of *Aedes aegypti* strain PCSIR collected from Clifton area were exposed to 1 ppm. DDT for 24 hours. Conversion of DDT into DDE in this strain was found higher than the reported ones.

SEVEN NEW RECORDS OF ASPERGILLUS SPECIES FROM LAHORE SOIL

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(Received September 17, 1965)

Six species and one variety of *Aspergillus* alongwith allied strains have been reported and described for the first time from three different soils of Lahore. Comparison with the type species is given.

STUDIES ON THE BIOLOGICAL CONTROL OF PHYTOPHAGOUS MITES (ACARINA: TETRANYCHIDAE) AND APHIDS (APHIDIDAE)

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(Received April 17, 1965)

A detailed survey of mites and aphids fauna and their predators has been carried out in and around Karachi (West Pakistan). During the survey some coccinellid beetles (*Stethorus pauperculus* Wsc., *Brumus suturalis* (F), *Adonia variegata* Goeze, *Menochilus sexmaculatus* (F) and *Coccinella septumpunctata* L.) and phytoseiid mites (*Typhlodromus* sp. and *Phytoseius* sp.) were found to be very effective predators of phytophagous mites (*Tetranychus telarius* (L)-*T. urticae* Koch and *Porcupinychus abutiloni* g. nov., sp. nov.¹) and aphids of bean and cotton (*Aphis fabae* Scop., *Aphis gossypii* Glov.). The rate of feeding of the predators has been studied in this paper. A brief note on the habits and life-histories of *Typhlodromus* sp., *Phytoseius* sp. and *Stethorus pauperculus* Wsc. is incorporated.

INVESTIGATIONS ON SALT RESISTANCE IN COTTON

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This investigation was carried out to find out the possibility of inducing salt resistance at germination stage by pretreatment of cotton seeds with calcium chloride and gibberellic acid. The pretreatment of cotton seed with calcium chloride before sowing in sodium chloride solution was found to increase salt resistance as observed by increasing percentage of germination. The pretreatment with gibberellic acid and calcium salts together before sowing in sodium chloride solution gave better germination only in case of Pak-American Cotton Variety M4 and not in case of Tandojam Desi Cotton Variety No. 1.

A STUDY OF FUNGUS FLORA OF KARACHI SOILS

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A study of fungus flora of Karachi soil was carried out to determine the frequency of occurrence of various fungi at different places and at different soil depths. A total number of 58 species belonging to 25 genera were isolated from these samples. Five genera and 7 species were recorded for the first time from West Pakistan. Eight genera and 13 species are new to Karachi region. The fact that more fungus species were isolated from surface and upper levels of soil than at lower levels may be due to poor aeration and antagonistic affects of certain microorganisms.

SHORT COMMUNICATION

269

STUDIES ON FAGONIA CRETICA LINN. PART II

WASIF HUSSAIN, S. F. HUSSAIN, M. IKRAM AND S. A. WARSI

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EQUIVALENT AND MOLECULAR WEIGHT DETERMINATION OF ALKALOIDS NON-AQUEOUS SOLVENTS

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TURPENTINE OIL-BASED CHEMICALS

Part II. – Production of p-Cymene from Pinene-free Turpentine Oil

ABDUL SATTAR, ZAHUR-UD-DIN, M. K. BHATTY AND KARIMULLAH

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UTILIZATION OF D.D.T. WASTE FOR THE PREPARATION OF SCARLET GG FAST DYE SALT AND A NEW SULPHUR GREY DYE

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PRELIMINARY SURVEY OF THE MEDICINAL PLANTS OF BALUCHISTAN

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(Received October 25, 1965)

GERMINATION OF UREDOSPORES OF PUCCINIA GRAMINIS PERS. ON CELLOPHANE PAPER

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A STUDY OF FUNGUS FLORA OF KARACHI CANTT. SOIL

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BOTANICAL STANDARDISATION OF FUMARIA PARVIFLORA LAMK.

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**COLOUR VARIATION: SEX RATION AND SIZE FREQUENCY OF OTOLITHUS
ARGENTEUS (CUVIER), (SILVER-BRANDED JEW FISH)**

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THE INFLUENCE OF CROP ON SOIL FUNGISTASIS*

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(Received May 20, 1965)

**CULTIVATION OF CHRYSANTHEMUM CINERARIAEFOLIUM (TREV.) BOCC.
PYRETHRUM-AT LOW ALTITUDE**

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(Received August 31, 1965)

**STUDIES ON THE IMPROVEMENT IN QUALITY BY CROSS BREEDING OF
RAMBOUILLET SHEEP BREED WITH INDIGENOUS KAGHANI SHEEP BREED**

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