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Physical Sciences Section

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THE ADSORPTION ISOTHERMS AND THE HEAT OF ADSORPTION OF METHYL ACETATE ON CARBON BLACK

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(Received August 28, 1973; revised December 6, 1973)

Abstract. The adsorption isotherms of methyl acetate on carbon black at 10° intervals in the temperature range $10-50^\circ$ have been measured and the heats of adsorption calculated as a function of coverage. The resultant curves are discussed in terms of the size of the adsorbate molecules and adsorbate, adsorbate and adsorbate-adsorbent interactions and show that the surface of an ungraphitized black behaves as if it were graphitized and uniform towards an adsorbate having large molecules which interact with each other on the surface.

SPECTROSCOPY OF IODONIUM COMPOUNDS

Part II. Xylyl Iodonium Compounds and their Spectra

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(Received June 1, 1974; revised January 1, 1974)

Abstract. *o*, *m* and *p*-xylyl iodonium compounds have been prepared and their IR spectra are recorded for the 1600–250 cm^{-1} region. The spectra of these 1,2,4-trisubstituted benzene derivatives are interpreted in terms of the variation in intensity with respect to the substituent positions in the corresponding xylyl halides where there are marked changes for the various vibrations. The UV spectra of the compounds have also been presented. IR and UV spectra both suggest that the iodonium cation in the *p*-xylyl compounds interacts with the π -electrons of the ring more than in the *ortho* and *meta*-xylyl compounds.

SOLVENT EFFECTS IN THE OXIDATION OF PYRIDINE TO PYRIDINE 1-OXIDE

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(Received August 23, 1973)

Abstract. Kinetics of the oxidation of pyridine with peroxybenzoic acid to form pyridine 1-oxide have been studied in a number of polar and nonpolar solvents. It has been shown that this reaction follows second order kinetics and its rate constant is inversely proportional to the dielectric constant of the solvent medium. Activation parameters for this reaction have also been worked out.

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VOLUMETRIC ESTIMATION OF TIN(II) WITH HEXAMINECOBALT(III) TRICARBONATOCOBALTATE(III) USING FERROIN AS REDOX INDICATOR

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(Received October 13, 1973; revised December 14, 1973)

Abstract. A quick, precise and accurate method for the estimation of tin(II) with hexaminecobalt(III) tricarbonatocobaltate(III) as an oxidizing volumetric titrant has been evolved. Effects of foreign ions like Zn^{2+} , Ag^{+1} , Al^{+3} and Pb^{+2} has also been reported.

QUANTITATIVE ESTIMATION OF BENZENE, TOLUENE, o-XYLENE AND p-XYLENE BY IR SPECTRA

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(Received January 19, 1973; revised December 11, 1973)

Abstract. IR spectroscopic method for the quantitative estimation of mixture of benzene, toluene, *o*-xylene and *p*-xylene has been investigated by using base-line measuring technique to the unknown and standards. For an IR spectrometer used for routine type of analysis, certain limitations and errors have been proposed for such studies.

Biological Sciences Section

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THE EFFECT OF FOOD RESTRICTION ON BODY WEIGHT, NITROGEN BALANCE AND LIVER COMPOSITION OF ADULT RATS

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(Received October 31, 1973; revised December 6, 1973)

Abstract. Adult male rats were fed a 5% protein diet, restricted to 70% of their normal food intake for 31 days. Dietary restriction resulted in increased catabolism of protein and large negative nitrogen balance, decreased body weight persisting for 10 days. After 20 days the loss of body weight ceased and negative nitrogen balance returned towards equilibrium. Although continued food restriction reduced the liver size but conservation of nitrogen was observed at the end of the experiment. It was suggested that adaptation to food restriction could be due to reduced nitrogen turn over or reduced caloric requirements.

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**MORPHOLOGY AND BIOLOGY OF MICROBRACON KHOKHARI, n. sp., AND M. GHANII, n. sp.
(HYMENOPTERA: BRACONIDAE) ECTOPARASITES OF SPOTTED BOLLWORMS***

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(Received August 18, 1973; revised December 6, 1973)

Abstract. *Microbracon* Ashmead is a well known genus of Braconid parasites all over the world. The species of the genus are ectoparasites in lepidopterous and coleopterous larvae. Two species of the genus *M. lefroyi* (D. and G.) and *M. kitcheneri* (D. and G.) are known to parasitise spotted-bollworms (*E. fabia* and *E. insulana*) apart from other lepidopterous larvae in Pakistan. Our investigations have revealed two other new species of the genus *khokhari*, n.sp., and *M. ghanii*, n.sp. parasitising the two bollworms species in Sind, Pakistan. In the present account has been given their morphology (females only), biology and life history.

Technology Section

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EFFECT OF PROCESSING AND STORAGE ON THE DEVELOPMENT OF BITTERNESS IN THE ORANGE JUICE

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(Received July 28, 1973; revised November 17, 1973)

Abstract. The effect of three methods of extraction, and pasteurization and storage on the limonin content of the juice from Valencia orange was determined. The limonin content of the fresh juice was observed to range between 2-3 p.p.m. and to increase to a level of 11-13 p.p.m. after pasteurization. There was little change in this constituent during storage. It appeared that most of the limonin had been formed from its non-bitter precursor (limonate A—ring lactone) during pasteurization. Changes in the ascorbic acid content, total titratable acidity, and pH of the juice during processing and storage was also determined.

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PROTEIN IMPROVEMENT IN WHEAT

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(Received April 27, 1973; revised December 14, 1973)

Abstract. Mutation breeding has been successfully employed to generate variability for protein characteristics and a few high protein wheat strains have been selected. Different levels of N fertilization have increased the protein and grain yields, and this increase is proportionately high in the radiation-induced protein-rich wheat mutant Rageni-15. It is suggested that we should consider adopting concept of 'crop protein yield' expressed for example, as kg protein/ha.

SOIL MOISTURE REGIME OF LOESSIAL SOILS IN WESTERN GERMANY AS AFFECTED BY ZERO-TILLAGE METHODS*

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(Received December 14, 1973)

Abstract. Continued application of zero-tillage on structurally instable loessial soils in W. Germany resulted in reduced total porosity of the top-soil, in an increased structural homogeneity down the soil profile, and—due to enhanced earthworm activity—in a system of continuous large pores connecting the atmosphere with deeper soil layers. Conventionally tilled soils, though generally less densely packed than untilled soils, were more or less compacted at a depth of 25–30 cm, due to puddling and smearing actions during ploughing.

In consequence of the structural changes the water holding capacity of untilled soil was increased, yet the soil water tension was decreased as compared to tilled soils.

Whereas in tilled soils, after heavy rainstorms, water infiltration was impeded by the plough pan, in untilled soil rainworm channels effected a rapid downward movement of rain water against the existing gradient of hydraulic potential. Thus run-off was decreased and water storage increased as compared to conventionally tilled soils.

Also, near water saturation, the water conductivity of untilled soils was calculated to be greater than in tilled soils. Estimated losses by evaporation during rainless period were equal on both soils.

LEAF PROTEIN CONCENTRATE IN HUMAN DIET*

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(Received July 5, 1973)

Abstract. The work was undertaken with a view of increasing the nutritive value of common Pakistani dishes. The dry matter, nitrogen content, fibre and organoleptic evaluation were analysed accordingly.

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CHARACTERISTICS OF MUNICIPAL WASTE WATER FROM MOSUL

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(Received May, 10, 1973; revised December 20, 1973)

Abstract. The waste water from the storm sewers was collected and analysed. Its characteristics and the average composition have been determined and analysed.