

PAKISTAN JOURNAL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Vol. 21, No. 1, February 1978

Physical Sciences. Pages 1-11

Biological Sciences. Pages 12-21

Technology. Pages 22-46



Published bimonthly by

PAKISTAN COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH
KARACHI

Physical Sciences Section

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

PREPARATION OF SOME NOVEL PYRIDONE DERIVATIVES [1]

ALAN R. KATRITZKY,* A. SULTAN AFRIDI and CHRISTOPHER A. RAMSDEN

School of Chemical Sciences, University of East Anglia, Norwich, NR4 7TJ, England

(Received February 20, 1978)

Abstract. 1-Amino-2- and -4-pyridone react with 4-pyrone to yield bipyridones. Some transformations of *N,N'*-bi-(2,6-lutidone) are described.

1-Amino-4, 6-diphenyl-2-pyridone reacts with α -haloketones to give oxadiazinopyridinium salts. 2-Aminopyridines and 2-methyl-4,6-diphenylpyrylium salts give the corresponding pyridylpyridinium salts.

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

**ON THE PROPAGATING SPECIES IN TETRAHYDROFURAN-FLUOROSULPHONIC ACID
POLYMERIZATION PROCESS**

M.U. MAHMUD*

*Institute für Organische Chemie, Johannes Gutenberg-Universität, Johann Joachim Becher-Weg
18-20, D-65 Mainz, W. Germany*

(Received 27 May 1977; revised 12 October 1977)

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

INVESTIGATION OF OXIDATION PROCESSES AT LEAD DIOXIDE ANODE

MOHAMMAD AMJAD

Chemistry Department, University of Engineering and Technology, Lahore

(Received October 17, 1977; revised November 29, 1977)

Abstract. The electrochemical behaviour of the lead dioxide anode for the oxidation of inorganic ions e.g., Cr^{+3} to Cr^{6+} and ClO_3^- to ClO_4^- and electrooxidations of organic compounds like simple alcohols and phenols in aqueous sulphuric acid has been investigated. Scanning electron micrographs of the surface of the anode were taken to establish surface changes. It is suggested that both chemical and electrochemical mechanisms occurred.

Biological Sciences Section

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

INITIATION OF PROCAMBIAL STRANDS IN THE PRIMORDIA OF STAMENS AND CARPEL OF TRITICUM AESTIVUM L.

PARVEEN AZIZ

PCSIR Laboratories, Lahore 16

(Received March 3, 1976; revised September 26, 1977)

Abstract. The procambial strands in the primordia of carpel and the stamens of *Triticum aestivum* L. originate independently and in isolation from the vascular system of the axis. The median strand of the carpel is initiated earlier than the two laterals. Once started, the procambial strands continue their initiation from their point of origin both acropetally and basipetally, the latter extension eventually linking them upto the strands lower down.

Short Communications

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

AN ABNORMAL SEEDLESS PAPAYA FRUIT RESULTING FROM VIRUS INFECTION

S. MAHDIHASSAN

S.D. 34, Block A, North Nazimabad, Karachi 33

(Received September 10, 1975; revised January 18, 1976)

like the petals of the flower, and these were fleshy and green like an unripe fruit. Obviously it was a monstrosity, a fruit bearing strong resemblance to the flower. Then the flower could change its sex, male flowers became females and bore fruits, not normal but brinjal shaped. All these features have been illustrated [3]. What was not yet observed was a fruit normal in taste but abnormal in shape. Fig. 1 is a papaya fruit which, by its shape, would be mistaken for a banana. A papaya fruit has a hollow space within, full of seeds if present; but even a seedless variety is not devoid of this concavity. Specimen Fig. 1 was longitudinally cut and its two

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

**ICERYA AEGYPTIACA AS INFECTING
A FIG TREE IN KARACHI**

S. MAHDIHASSAN

S. D. 34, Block A, North Nazimabad, Karachi 33

(Received May 17, 1976)





Fig. 3.

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

THE MANGO TREE IN KARACHI AS EXTENSIVELY INFECTED BY A SCALE-INSECT

S. MAHDIHASSAN

S.D. 34, Bcok A, North Nazimabad, Karachi 33

(Received November 24, 1976)

Technology Section

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

THE MINERALOGY AND GEOCHEMISTRY OF SOME CLAYS FROM NAGARPARKAR

S. R. HASSAN BAQRI

Department of Geology, University of Southampton, Southampton, England

(Received January 10, 1977)

Abstract. The clays of Parodharo near Nagarparker are exposed in a nala and can be divided into yellow and white clays on the basis of colour. Thirteen samples were collected from these clays for mineralogical, chemical and economic studies. Both types of clay contain dominant kaolinite with traces of illite. Yellow clays contain some goethite and quartz in addition. The mineralogy, chemistry and the behaviour of the clays at high temperatures makes them very suitable for ceramic and refractory use.

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

THE MINERALOGY AND CHEMISTRY OF REFRACTORY CLAY DEPOSITS FROM LAKHRA AND JHAMPEER IN SIND, PAKISTAN

S.R. HASSAN BAQRI

Department of Geology, University of Southampton, Southampton, England

(Received February 8, 1977)

Abstract. The well-known coal seams at Lakhra and Jhampeer occur in the Ranikot Formation and the Sonahri Beds. The refractory clays are found in the roof rocks and the seatearths associated with the coal seams. Twenty-six samples of roof rocks, fourteen from Lakhra and twelve from Jhampeer were obtained for mineralogical, chemical and thermal investigation. The refractory clays from both localities have dominant kaolinite with some quartz and anatase. Those from Lakhra also contain traces of illite. These contain higher clays amounts of aluminium and titanium and a lower alkali content than clays of similar origin from other regions, and can be used for making sanitary ware, buff tiles, engineering bricks and refractories.

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

SULPHUR COMPOUNDS IN LIGHT ARABIAN AND KUWAIT CRUDE OILS

MOHAMMAD FARHAT ALI*

(Received September 23, 1975; revised November 10, 1976)

Abstract. The sulphur compounds in petroleum, both as to type and quantity, have long been of concern to the refiners due to their corrosiveness, disagreeable odour, deleterious effects on colour or colour stability, and unfavourable influence on antiknock and oxidation characteristics. A systematic study of the distribution of sulphur compounds in crude oils is not only of theoretical interest, but also of practical value to petroleum industry.

A study of the type of sulphur compounds present in light Arabian and Kuwait crude oils distillates up to 600°F has been carried out. The sulphur type distribution of the following types of sulphur compounds is discussed: hydrogen sulphide, elemental sulphur, mercaptans, aliphatic sulphides, aromatic sulphides, disulphides and residual sulphur.

Pakistan J. Sci., Ind. Res., Vol. 21, No. 1, February 1978

CHEMICAL AND ORGANOLEPTIC CHARACTERISTICS OF TRAWLER CAUGHT SHRIMPS FROM THE KARACHI-MAKRAN COAST

Part I. Changes During Ice Storage and their Possible Use as Quality Indices

BILQUIS FAROOQUI, R.B. QADRI, RIAZ FATIMA, RAZIA RAFIQUE and A.H. KHAN

PCSIR Laboratories, Karachi 39

(Received January 12, 1977; revised May 8, 1977)

Abstract. Studies have been carried out on chemical and microbiological changes that occur during ice storage of shrimps, under commercial conditions. These changes are compared as indices of quality in relation to organoleptic changes.

Significant correlation coefficients (r) are obtained between the mean organoleptic response (MOR) and the various objectively measured changes during the storage period. The merits of some of these changes as objective indices of quality particularly in relation to taste panel assessment are discussed.

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

CHROMATOGRAPHY OF PHOSPHATE ESTERS

Part II. Separation by Thin Layer Chromatography

M. YOUNAS and M. AKHTAR

Institute of Chemistry, Punjab University, Lahore

(Received February 21, 1977; revised July 20, 1977)

Abstract. Phosphate diesters have been separated by thin layer chromatography on silica gel GF₂₅₄ (type 60) at 25°C with chloroform: methanol (65:35) as an irrigating solvent system. R_f values of the esters in the pure form as well as in mixture have been reported.

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

COMPARISON OF FOUR EXTRACTION METHODS FOR THE ESTIMATION OF AVAILABLE ZINC FOR WHEAT

F.M. CHAUDHRY, S.M. ALAM, M.A. KAUSAR and A. RASHID^{*}

Nuclear Institute for Agriculture and Biology, Faisalabad

(Received August 31, 1976; revised December 7, 1976)

Abstract. All the four methods of Zn extraction i.e. DPTA (diethylenetriaminepentaacetic acid), EDTA (ethylenediaminetetraacetic acid), HCl, and NH_4OAc successfully measured plant-available Zn and predicted its deficiency for wheat crop. The correlation coefficients of various methods with Zn concentration in plants were 0.91, 0.86, 0.87, and 0.70 and with total Zn contents 0.87, 0.86, 0.82, and 0.56 respectively. The critical Zn concentration of four methods that distinguished Zn-deficient from nondeficient soils were 0.34, 0.45, 2.4 and 0.48 ppm respectively. The DTPA method is superior to other methods for the current calcareous soils. It is recommended as a routine method as it also simultaneously extracts plant available Cu, Fe and Mn contents of soils.

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

LEAD DIOXIDE ELECTRODE FOR ANODIC OXIDATIONS

MOHAMMAD AMJAD

Department of Chemistry, University of Engineering and Technology, Lahore

(Received June, 29, 1977; revised August 4, 1977)

Abstract. The lead dioxide covered vitreous carbon anode has been prepared by electro-deposition from various electrolytes. The performance characteristics of the thick deposits are described and the change of the surface with time before and after polarisation at different potentials has been elaborated with Scanning Electron Micrographs (SEM).

Short Communication

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

SEEDS OF PEGANUM HARMALA A Possible New Source of Edible Oil

SALIMUZZAMAN SIDDIQUI and (Miss) NIGHAT AFZA

*H.E.J. Postgraduate Institute of Chemistry, University
of Karachi, Karachi 32*

(Received January 12, 1978)

TABLE 1. COMPARATIVE CONSTANTS OF THE
COTTONSEED AND *Pegnum harmala* KERNEL OILS.

Physical and chemical constant	Cottonseed oil	<i>Pegnum harmala</i> kernel oil
Specific gravity	0.917-0.0918	0.9149
Refractive index	1.4745	1.470
Tintometer number	Yellow-2 Red-0.4	Yellow—2 Red—1.4
Acid value	0.6-0.9	3.0