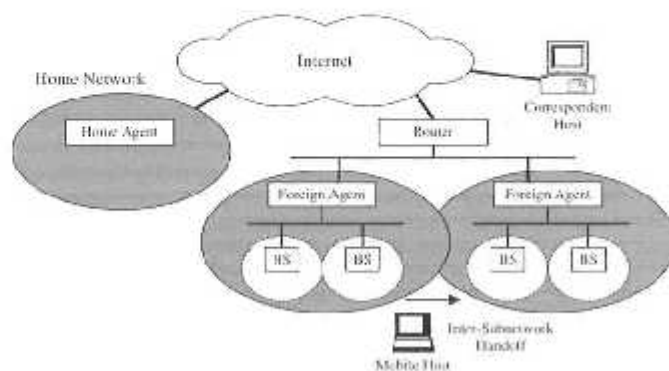


## CONTENTS

### Management & Information Technology

- 489 **An Efficient Utilization of Spectrum in Seamless Mobility by Using Retransmission Rerouting Mechanism in Mobile IP**

Without an iota of doubt, the aspect of seamless mobility has become an important characteristic for high-fidelity wireless communication. As handy and trendy cell phones / smart phones are primarily used for the communication purpose, the cell coverage zones are mandated to be of high quality and adaptively to make and receive calls with all clarity and confidence. Usually, the seamless mobility capability is being achieved through the automatic handover from one cell to another under certain situations. The aspect of automatic handover is the process of adaptively changing the connection linkage established and being currently used to another connection even when the user is still talking. This channel shift is initiated often when crossing a borderline of the cell or if there is a substantial downturn in the receiving signal quality in the current channel.



A Jayanthiladevi & G M Kadharnawaz

### S & T and Industrial Research

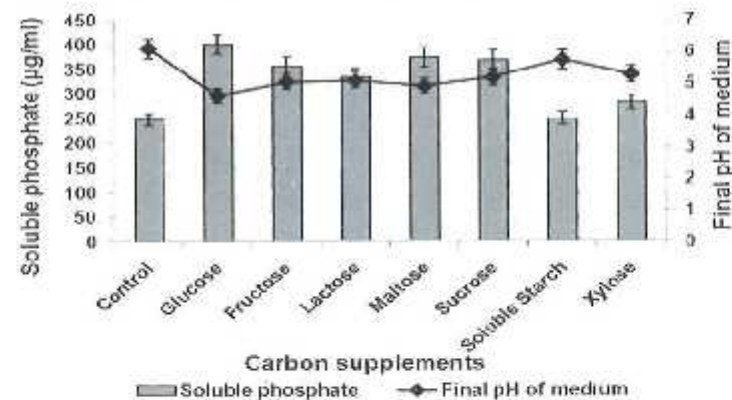
- 494 **Suitability of Transesterified Mahua (*Madhuca indica*) Oil as Diesel Fuel**

Biodiesel is an attractive alternative fuel to diesel engines because it is renewable and non-polluted fuel that can be produced from plant and animal fats. The plant and animal fats derived oil can be used as biodiesel either solely or its blending with diesel. Further, it can be used in either extracted form or after transesterification. *Madhuca indica* fruit oil was evaluated in this study to find out its suitability to be used as biodiesel. The oil was extracted from *Madhuca indica* fruits using diethyl ether and ethanol (3:1) by centrifugation method. Extracted oil was divided into three equal parts. One part of oil was blended with 5% diesel, second part was transesterified to produce methyl esters and the third part was kept as such. All the three parts of oil were evaluated and compared for their suitability to use as biodiesel on the basis of various physico-chemical parameters.

K P Prajapati, P Shilpkar & M C Shah

- 499 **Phosphate solubilizing potential of *Aspergillus niger* MPF-8 isolated from Muthupettai mangrove**

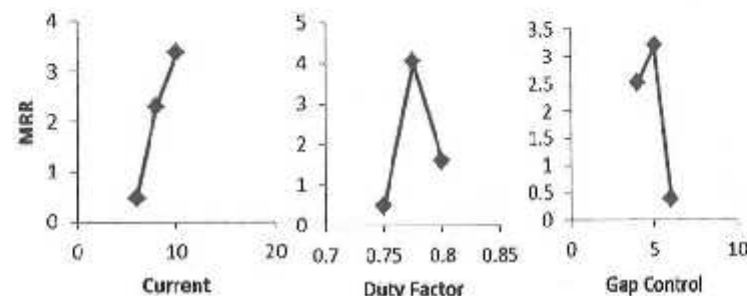
The present study deals with the isolation of fungi from the mangrove sediment and determining their tri-calcium phosphate solubilization efficiency. Among the 47 fungal isolates, MPF-8 showed maximum phosphate solubilization and based upon molecular identification using 18S rDNA sequencing was identified as *Aspergillus niger*. Among the various carbon and nitrogen sources added to Pikovskaya broth, maximum phosphate solubilization, 401  $\mu\text{g/ml}$  and 427  $\mu\text{g/ml}$  were recorded with glucose and ammonium sulphate supplementation, respectively.



S Bhattacharya, A Das, S Bhardwaj & S S Rajan

- 504 **Mixing Torque Measurement - an Effective Tool for Identifying Critical Binder Volume Concentrations for Ceramic Processing**

Ceramic processing of powders, mixed with additives, can be classified into three regimes: CBVC [Critical Binder Volume Concentration], sub CBVC and post CBVC which correspond to viscous plastic processing, compaction processing and colloidal processing respectively. These regimes can be estimated experimentally by measuring the mixing torque for different ratios of the powder to additive concentration. In the present study, the torque required for mixing is indirectly estimated by measuring the torque of the AC motor that drives the blender. Analysis of the Torque vs Volume Concentration curve permits delineation of the three zones. Our present study was carried out using alumina powder mixed with a binder. The developed torque was logged in a paperless chart recorder, with built-in storage memory.



N Sanikommu, K Bhargavi, M B Suresh, R Johnson & A S Joshi

- 508 **Parametric Investigation and optimization of Near-Dry Electrical Discharge Machining**

This study investigates near-dry Electric Discharge Machining (EDM) in order to achieve higher Material Removal Rate (MRR), lower Tool Wear Rate (TWR) and Better surface finish than conventional EDM on High Speed Steel (HSS) workpiece. Taguchi  $L_{27}$  orthogonal array was used for conducting experimentation. The experiments have been conducted by mixing of limited quantities of water with high pressure air (air-mist). This paper presents a relatively simple device to be used for applying the near-dry EDM. The near-dry EDM does not produce toxic fumes so called Environment friendly machining process for the applied operating conditions. The near-dry electrical discharge machining presents some advantages regarding the machined surface quality and the electrode tool wear, in comparison with the machining that uses liquid dielectric. The effect of different process parameters like applied current, duty factor, gap control, sensitivity, tool lift was analyzed on MRR, surface finish and tool wear rate.

H Pandey, K Dhakar, A Divedi & P Kumar

## Energy and Environment

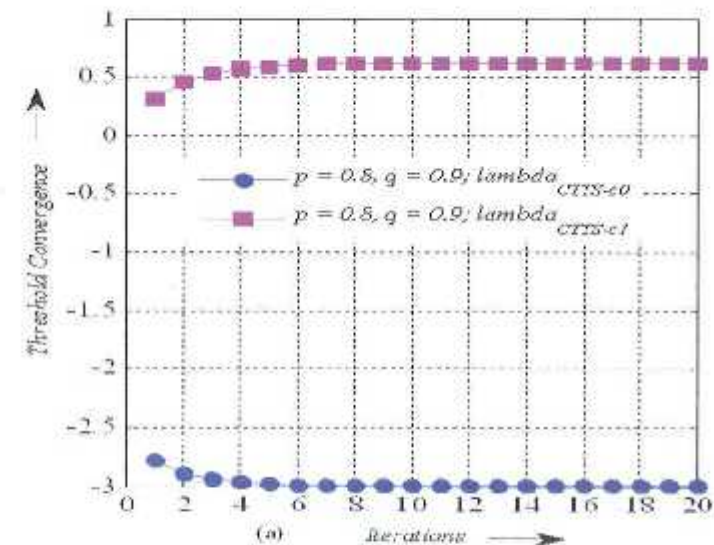
- 512 **Cashew-nut husk Natural Dye Extraction Using Taguchi Optimization: Green Chemistry Approach**

Using natural dyes instead of their synthetic counter parts is very good example of implementation of green chemistry principles. The present study is focused on optimization of extraction conditions during natural dye extraction from cashew-nut husk, an agro-waste. Taguchi technique was employed for optimizing the parameters namely particle size of the raw dyestuff, solid-liquid ratio, time of extraction and method of extraction assistance. The results indicated 150 micron particle size, 1:20 as solid-solvent ratio, three hours for extraction and enzyme addition as assistance for extraction as the optimum conditions for extraction.

P D Patil, C R Rao, A I Wasif, S V Anekar & J R Nagla

- 518 **Ammonia free delimiting process in leather industry based on eco-benign products**

Delimiting is one of the most important unit operations in leather processing. Conventional delimiting process employs ammonium salts which generates considerable amount of ammonia during the process, making tannery environment unhealthy. Therefore ammonia free delimiting process is necessary in view of environmental concern. Even though ammonia free alternate delimiting processes have been studied earlier, they have not yet provided commercial viability so far. Hence in this paper, ammonia free delimiting process based on eco-benign natural products as developed by CSIR-CILRI has been presented.

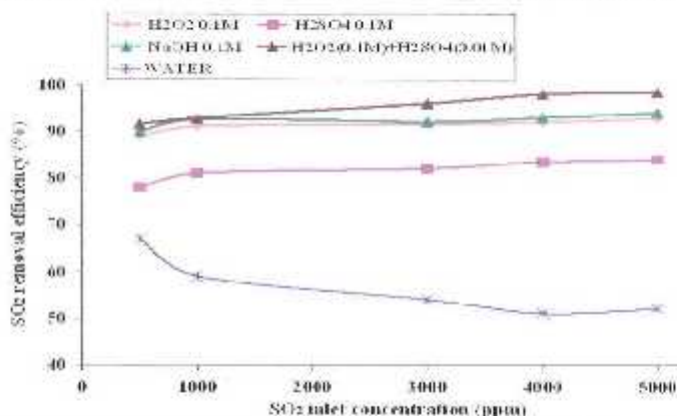


V Sivakumar, C Ponnusawmy, K Sudalaimani, T Rangasamy, C Muralidharan & A B Mandal



522 **Experimental investigations on pilot plant SO<sub>2</sub> emission control system**

This paper provides experimental investigations for optimizing the parameters to work with pilot plant experimental system for achieving maximum SO<sub>2</sub> removal efficiency. It is analysed with different absorbers such as, water, NaOH, H<sub>2</sub>O<sub>2</sub> and H<sub>2</sub>SO<sub>4</sub> with different combinations and concentrations. The results reveal that, the removal efficiency acquired is 98.4% by adding 0.1M hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) externally on 0.01M sulphuric acid (H<sub>2</sub>SO<sub>4</sub>) solution. From the analysis, polypropylene pall rings with diameter of 15 mm, liquid flow rate of 150 lph, gas flow rate of 40 m<sup>3</sup>/hr and packed height of 1M are chosen based on their performance in increasing the SO<sub>2</sub> absorption rate.

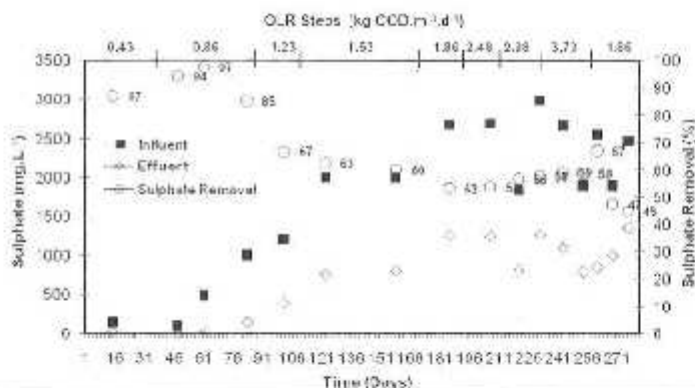


C Maheswari, K Krishnamurthy,  
R Parameshwaran & B Meenakshipriya

### Waste Utilization

526 **Anaerobic treatment of high sulphate containing pharmaceutical wastewater**

The effect of different organic loading rate (OLR) to an anaerobic reactor performance and sulphate reduction was investigated. Sulphate concentration in the feed varied from 100 to 3000 mg.L<sup>-1</sup> and up to 97% removal efficiency was observed at OLR 0.43 - 1.23 kg COD.m<sup>-3</sup>.d<sup>-1</sup>. However, the removal efficiency showed some decline (to 53 - 67% removal) at OLR 1.53 - 3.73 kg COD.m<sup>-3</sup>.d<sup>-1</sup>, probably due to high sulphate concentration in the feed during this period. At a reactor OLR of 1.86 kg COD.m<sup>-3</sup>.d<sup>-1</sup> (HRT 4 d), the soluble COD reduction was around 70 - 75%. Nevertheless, when the OLR was increased to 2.48 - 3.73 kg COD.m<sup>-3</sup>.d<sup>-1</sup>, the COD removal efficiency decreased to 45%. The microbial aspects of sulphate reducing bacteria (SRB) results indicated that sulfidogenic bacteria, such as *Desulfotribria*, had contributed substantially to the treatment process (around 16 - 36% when the reactor was operated at OLR 0.86 - 2.98 kg COD.m<sup>-3</sup>.d<sup>-1</sup>).



S Chelliapan & P J Sallis

### Author-Reader Platform

531 **Instructions to contributors**