

Journal of Scientific & Industrial Research

VOLUME 69

NUMBER 11

NOVEMBER 2010

CONTENTS

Management & Information Technology

- 811 Track control in automated welding of saddle curve** This study establishes trajectory model and welding torch pose model, and presents a four-axis (θ , y , r and η) interpolation algorithm for saddle curve (SC) automatic welding. Algorithm is simulated to verify its feasibility by simulating SC with MATLAB and OpenGL tool software.

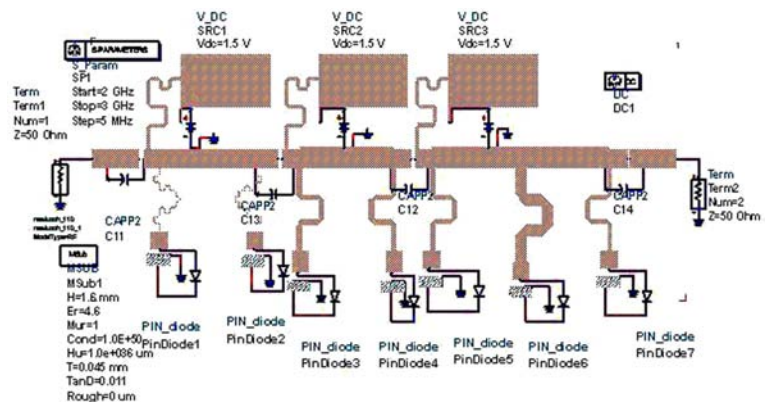
Yan Lü, Xincheng Tian & Jun Liang

S & T and Industrial Research

- 818 Agro-ecological zoning of brown planthopper [*Nilaparvata lugens* (Stal)] incidence on rice (*Oryza sativa* L.)** Multiple linear regression models (pest-weather models) were developed between monthly mean brown planthopper (BPH), *Nilaparvata lugens* light trap catches and monthly mean values of minimum temperature (T_{min}), maximum temperature (T_{max}), morning relative humidity (RH_1) and evening relative humidity (RH_2) observed at Maruteru, Andhra Pradesh during 2000-2007 *kharif* seasons. Comparison between predicted and observed BPH light trap catches at Nellore (*kharif* 2004 and 2005), Ragolu (*kharif* 2003-2007) and Rajendranagar (*kharif* 2005 and 2007) evinced very high level of congruence between them, thereby validating agro-ecological zoning of BPH incidence in Andhra Pradesh.

D S Yadav, Subhash Chander & K Selvaraj

- 823 A novel miniaturized loaded line phase shifter** This study proposes a novel design of phase shifter for WLAN applications, by using Koch fractal curves to reduce size of conventional loaded line phase shifter (PS). Proposed PS provides an area reduction (41.88%) in comparison with conventional PS.

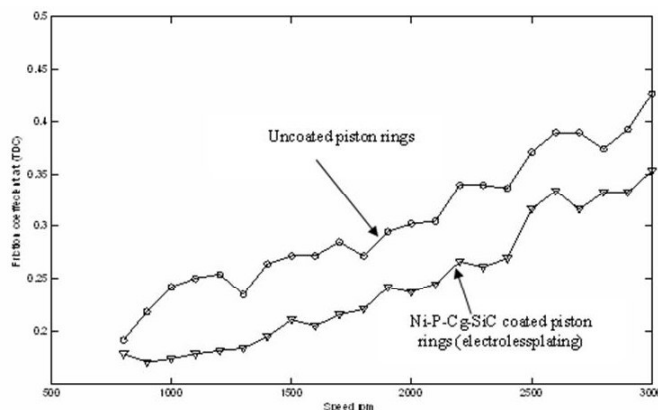


V K Manoharan, S Sindhuja,
S Deepak Ram Prasath, S Raju &
V Abhaikumar

S & T and Industrial Research

830 Electroless Ni-P-C_g(graphite)-SiC composite coating and its application onto piston rings of a small two stroke utility engine

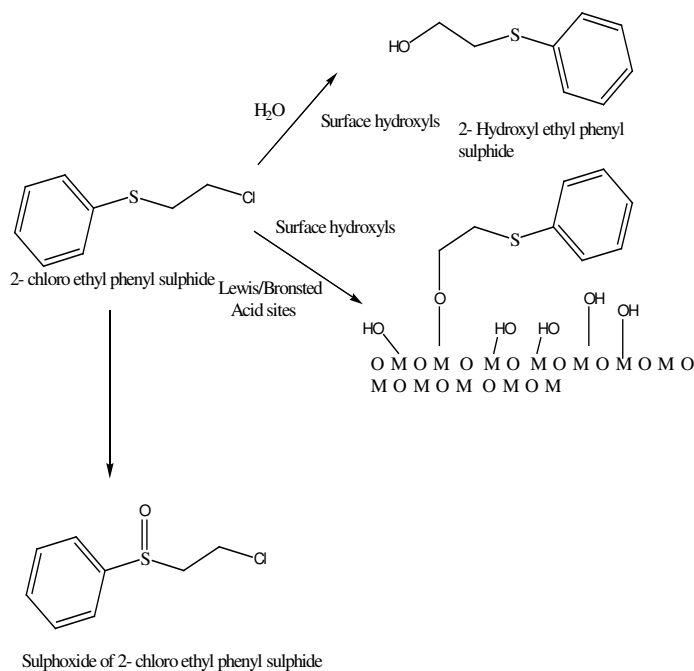
This study presents electroless Ni-P-C_g (graphite)-SiC composite coating deposition onto piston rings of a small two stroke utility engine at 90°C under C_g (10 g/l) and SiC (8 g/l) concentration at agitation speeds of 160 rpm. Coating showed compact embedding of C_g and SiC particles in Ni matrix, uniformly and largely distributed in coating by mechanical stirring. Heat-treatment of coating increased microhardness due to crystallization of a hard Ni₃P phase after heat treatment.



Farhad B Bahaideen, Zaidi Mohd Ripin & Zainal Arifin Ahmad

835 Decontamination of 2 chloro ethyl phenyl sulphide using mixed metal oxide nanocrystals

Decontamination reaction of 2 chloro ethyl phenyl sulphide (2-CEPS), a surrogate of sulphur mustard, was studied on nanocrystals of AP-Al₂O₃, AP-Al₂O₃-Fe₂O₃, AP-Al₂O₃-V₂O₅ and AP-Al₂O₃-CuO by using gas chromatography, gas chromatography-mass spectrometry and infrared spectroscopy techniques. Decontamination of 2-CEPS resulted via hydrolysis, oxidation and formation of surface bound alkoxides on AP-Al₂O₃-V₂O₅, whereas on AP-Al₂O₃, AP-Al₂O₃-Fe₂O₃ and AP-Al₂O₃-CuO, decontamination of 2-CEPS resulted by hydrolysis and formation of surface bound alkoxides.

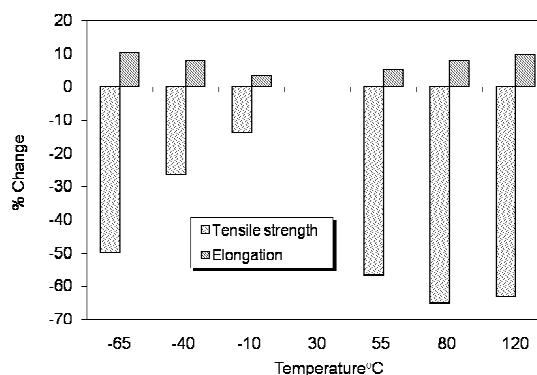


G K Prasad

S & T and Industrial Research

841 Thermal ageing studies of bromo-butyl rubber used in NBC personal protective equipment

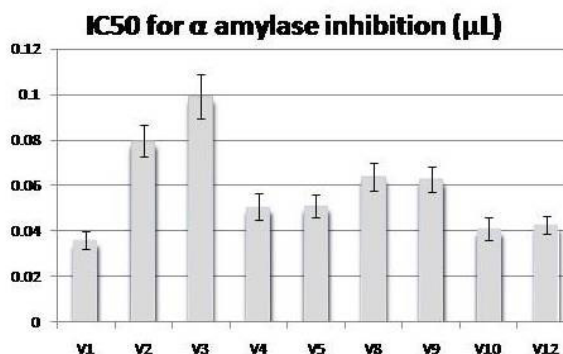
This study evaluates degradation and stability of bromo-butyl rubber (BBR) used in NBC personal protective equipment. Elongation increased by 10% when BBR was exposed to -65°C as well as 100°C. Tensile strength decreased by 50% when exposed to -65°C and also at 55°C, and decreased to around 63% when exposed to 80° and 100°C. Morphological appearance at 80°C aged sample was intact and comparable with unaged samples. BBR exposed to 120°C developed minor cracks (<0.01 µm). Life prediction was 89 and 25 years for exposed usage temperature of 40° and 50°C respectively.



G K Kannan, L V Gaikewad, L Nirmala & N S Kumar

850 Prebiotic potential of 'juice grape' varieties and some hybrids

This study presents prebiotic potential of 9 grape varieties [4 marketed 'juice' grapes (G1, G2, G3, and G9) and 5 hybrids (G4, G5, G8, G10 and G12)] using 4 individual probiotics and a consortium. Marketed fructooligosaccharide (FOS) was used as a standard prebiotic. G10 showed higher growth response to *Lactobacillus acidophilus* and *L. delbrueckii* and reduced *Escherichia coli* counts with zone of inhibition against *E. coli*. Inhibitory activity of α amylase as IC₅₀ was lowest for G1 and G10. All grape varieties and hybrids showed prebiotic activity (21.2-72.5% of FOS) with G1 and G10 being promising types.



Vaishali Agte, Neelima Khetmalis, Smita Nilegaonkar, Surekha Karkamkar & Supriya Yadav

855 β -Galactosidase production and ethanol fermentation from whey using *Kluyveromyces marxianus* NCIM 3551

β -Galactosidase production and ethanol fermentation from whey were studied using *Kluyveromyces marxianus* NCIM 3551 at laboratory scale. Optimum β -galactosidase production and ethanol fermentation was obtained with 16 h old culture at an inoculum size of 10% over an incubation period of 20 h at pH 5.0 and at 25°C.

A M Gupte & J S Nair

S & T and Industrial Research

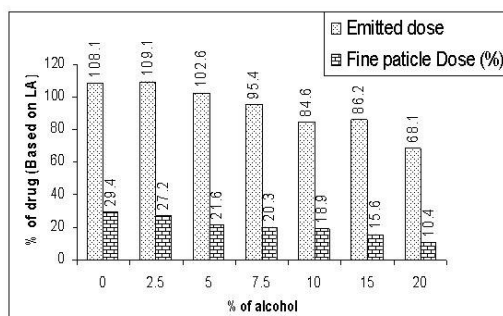
860 Study on enzyme-assisted aqueous extraction of oil from soybean

This study presents enzyme-assisted aqueous extraction (EAAE) method for oil extraction from soybean. Parameters for EAAE of oil with 1398 neutral protease were optimized through single-factor and orthogonal test. Soybean oil (yield, 80.2% w/w) was achieved under following optimized conditions: enzyme (conc., 840 IU / g soybean; pH, 7.0); enzymatic hydrolysis (temp., 45°C; time, 1.5 h); ratio of petroleum ether to soybean oil, 4:1(v/w); extraction (temp., 30°C; time, 15 min; pH, 4.5); and centrifugation force, 1400×g.

Jun-Qing Qian, De-Huai Qin, Xiang-Mao Xie & Wen-Wu Zhou

866 Performance of CFC free propellant- driven MDI of fluticasone propionate

Metered dose inhalers (MDIs) of fluticasone propionate were developed for treatment of asthma and chronic obstructive pulmonary disease. MDIs with hydrofluoroalkanes based propellants were formulated with various doses, overages and various concentrations of alcohol. Optimum requirements were found as follows: effective valve delivery, overages (15%); 100% drug delivery, overages (20%); and emitted dose and fine particle fraction, alcohol content (5-10%).

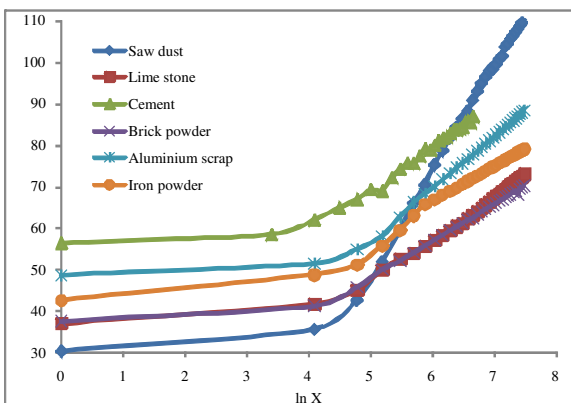


T E G K Murthy, M Bala Vishnu Priya & V Satyanarayana

Energy and Environment

872 Estimation of effective thermal conductivity of two-phase materials using line heat source method

This study presents fabrication of an experimental setup based on line heat source method and automate data acquisition software (LabVIEW) was used to measure thermal conductivity (TC) of two-phase materials (TPMs) with various temperatures. TC measurement of various TPMs has been carried with a minimum value (0.178 W/m°C) for saw dust and maximum value (0.64 W/m°C) for iron powder.



A P Senthil Kumar, V Prabhu Raja & P Karthikeyan

Energy and Environment

879 Thermal degradation and burning behaviour of cellulose based and cellulose-silk blended upholstery fabrics

This study presents thermal degradation and burning behaviour of cellulose based and cellulose-silk blended upholstery fabrics treated with phosphorus (chemical A) and halogen (chemical B) based flame retardant (FR) chemicals. Effect of FR reduced after treated fabrics were washed for 3 repeated cycles; rate of flame spread and char length were significantly lower when compared to control samples. Thus impregnation of FR on cellulose and silk made them force out water vapour under initial burning condition and thereby resisted burning.

K S Muralidhara & S Sreenivasan

Author-Reader Platform

886 Instructions to contributors

Author Index

Abhaikumar V	823	Nirmala L	841
Agte V	850	Prasad G K	835
Ahmad Z A	830	Prasath S D R	823
Bahaaideen F B	830	Priya M B V	866
Chander S	818	Qian J -Q	860
Gaikewad L V	841	Qin D H	860
Gupte A M	855	Raja V P	872
Kannan G K	841	Raju S	823
Karkamkar S	850	Ripin Z M	830
Karthikeyan P	872	Satyanarayana V	866
Khetmalis N	850	Selvaraj K	818
Kumar A P S	872	Sindhuja S	823
Kumar N S	841	Sreenivasan S	879
Liang J	811	Tian X	811
Lü Y	811	Xie X M	860
Manoharan V K	823	Yadav D S	818
Muralidhara K S	879	Yadav S	850
Murthy T E G K	866	Zhou W W	860
Nair J S	855		
Nilegaonkar S	850		

Keyword Index

2 Chloro ethyl phenyl sulphide	835	Ni-P-C _g (Graphite)-SiC coating	830
α -Amylase inhibition	850	Non-Cartesian configuration	811
β -Galactosidase	855	Orthogonal test	860
Activation energy	879	Overages	866
Alcohol fermentation	855	Pest zoning	818
Aqueous Extraction	860	Pest-weather model	818
Automated welding	811	Phase shifter	823
Bluetooth	823	Phased array	823
Bromo-butyl rubber (BBR)	841	Prebiotic potential	850
Brown planthopper	818	Rate of flame spread	879
Composite coating	830	Reliability	872
Decontamination	835	Rice	818
Electroless plating	830	Saddle curve	811
Emitted dose	866	Soybean Oil	860
Enzymatic hydrolysis	860	Spray pattern	866
<i>Escherichia coli</i>	850	Thermal ageing	841
Fluticasone propionate	866	Thermal conductivity	872
FR4	823	Thermal degradation	879
Grape	850	Thermal oxidation	841
<i>Kluyveromyces marxianus</i> NCIM 3551	855	Thermal probe	872
Koch fractal	823	Track control	811
Lactic cultures	850	Two-phase materials	872
Loaded line	823	Valve delivery	866
Metered dose inhalers	866	Vertical flammability	879
Microstrip	823	Weight loss	879
Mixed metal oxides	835	Whey	855
Nanocrystals	835	WLAN	823
NBC equipment	841	Yeast	855