

Journal of Scientific & Industrial Research

VOLUME 69

NUMBER 12

DECEMBER 2010

CONTENTS

Review

901 Ayurvedic Bhasma: the most ancient application of nanomedicine

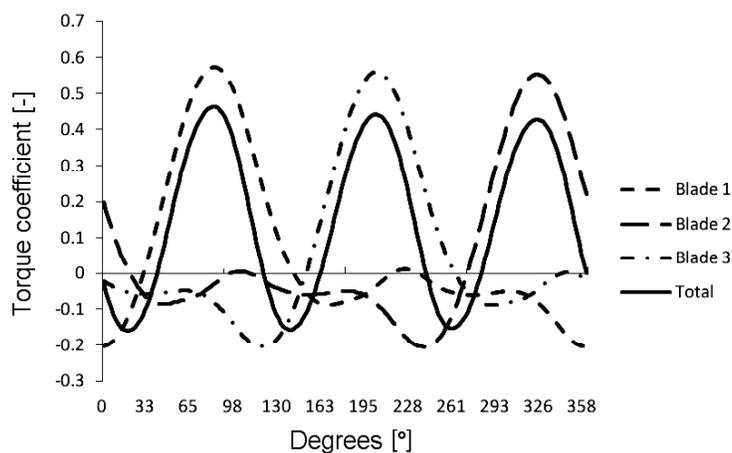
In practice of Ayurveda, herbo-mineral/metallic formulations (*Bhasma* of metals and minerals) are used since 7th centuries. It was supposed that these medicines have superior level of efficacy in comparison to other Ayurvedic dosage forms. Several studies claimed that *Bhasmas* are biologically produced nanoparticles.

Prasanta Kumar Sarkar &
Anand Kumar Chaudhary

Management & Information Technology

906 Simulation and evaluation of a straight-bladed Darrieus-type cross flow marine turbine

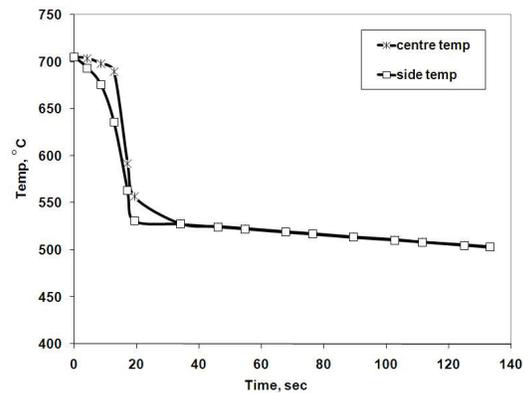
This study presents numerical simulations of a cross-flow vertical-axis marine current turbine (straight-bladed Darrieus type) with particular emphasis on rotor-performance prediction and hydrodynamic characteristics. A physical transient-rotor-stator model with a sliding mesh technique was used to capture change in flow field at a particular time step. A shear stress-transport $k-\omega$ turbulence model was used to model turbulent features of the flow. Developed model can effectively predict hydrodynamic performance of a vertical-axis marine current turbine.



Management & Information Technology

913 Numerical simulation of aluminum bar casting for wire rod production

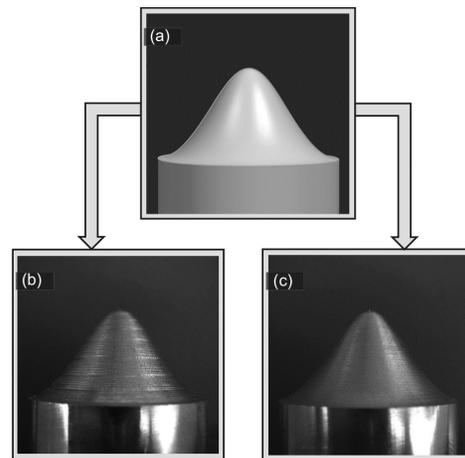
In a continuous casting of wire rod production, a cast bar, which is formed in a rotating wheel mould, is subsequently rolled by a set of rolls to form wire rod. Temperature of cast bar predicted by model has been verified by actual temperature measurement during casting at different operating conditions. Simulation results show the influence of various operating parameters on temperature distribution of cast bar.



S P Mohapatra, S K Sahoo, S Nanda,
P Hembram, A Palchaudhary & S C Patnaik

919 Extending tool-life through jerk-limited motion dynamics in machining processes: An experimental study

This paper analyzes jerk repercussion in tool life under an experimental study on a retrofitted CNC lathe, where a trochoidal geometry is machined. Results show an up to 60% tool-life improvement and 50% of surface roughness reduction when jerk-limited motion dynamics on machining process are utilized.



J R Rivera-Guillen, R J Romero-Troncoso, R
A Osornio-Rios, A Garcia-Perez &
I Torres-Pacheco

926 Solving an economic production lot size problem with multi-delivery policy and quality assurance using an algebraic approach

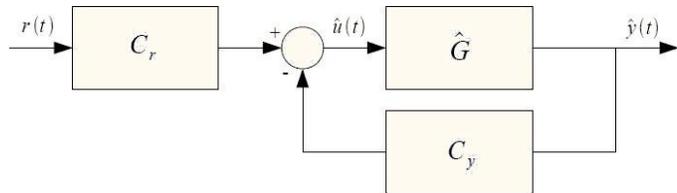
This paper studies an economic production lot size problem with multi-delivery policy and quality assurance using an algebraic approach for practitioner, who may not have enough knowledge of differential calculus, to understand such an integrated production-shipment system. A recent study¹⁹ examined same problem using mathematical modeling and differential calculus to derive optimal replenishment lot size.

Yuan-Shyi Peter Chiu, Kuang-Ku Chen &
Huei-Hsin Chang

Management & Information Technology

930 Model-based iterative feedback tuning for industrial PID controllers

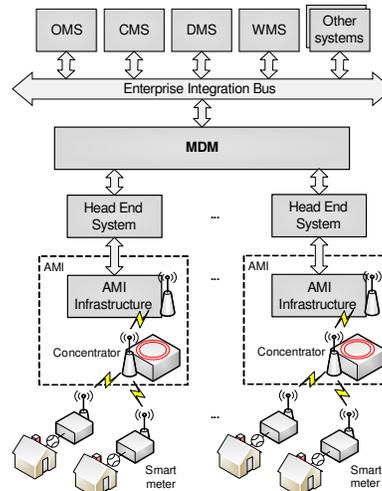
This paper proposes a model-based iterative feedback tuning over a pseudolinear closed loop output model basis. Its effectiveness is proven in an industrial level-control system.



M Milosawlewitsch-Aliaga, R A Osornio-Rios & R J Romero-Troncoso

937 A novel software architecture for smart metering systems

For smart metering systems (SMSs), this study presents a novel architecture, which allows simple, secure and fast integration of SMSs with other software products. Proposed architecture that combines better features of two models [Common Information Model (CIM) and OPC's Unified Architecture (UA)] has proven in practice as a good basis for a commercial Meter Data Management System.



Srdan Vukmirovic, Aleksandar Erdeljan, Imre Lendak & Darko Čapko

S & T and Industrial Research

942 Molecular and biochemical characterization of extracellular tannin acyl hydrolase activity from a Mexican isolate of *Aspergillus niger*

Microbial tannase, a hydrolysable tannin-degrading enzyme, is extensively used in manufacture of instant tea, beer, wine, and gallic acid. *Aspergillus niger* strain, obtained from a Mexican tannery wastewaters rich in gallic acid [Quebracho Phenolics-rich Tannery Wastewaters, (QPTW)], displayed a good growth and tannase activity in a minimal medium added with 1% (w/v) QPTW ($K_I = 0.451 \text{ mm}\cdot\text{h}^{-1}$). Using PCR and RACE 3' and 5' methodologies, a complete cDNA of a tannase was cloned from this isolate. *A. niger*-GTO is a new strain with interesting characteristics for industrial tannase production purposes.

Fabiola León-Galván, Irineo Torres-Pacheco, Fernando Jiménez-Espinoza, Sergio Romero-Gómez, Lorenzo Guevara-Olvera, Ana Paulina Barba de la Rosa, Mario M González-Chavira & Ramón Gerardo Guevara-González

S & T and Industrial Research

- 948 Potential of thermophilic bacteria as microbial inoculant for commercial scale white button mushroom (*Agaricus bisporus*) compost production**

Thermophilic bacteria (9), isolated from button mushroom (*Agaricus bisporus*) compost samples, were evaluated for temperature requirement, extracellular lignocellulolytic enzymes activity assay and potential for white button mushroom compost production. Optimum growth in different bacteria was between 43-55°C. Highest activity of exoglucanase and endoglucanase was recorded in *Staphylococcus* sp., while that of β -glucosidase in *Bacillus brevis* and *B. megaterium*, and xylanase as well as laccase in *B. stearrowthermophilus*. *Staphylococcus* sp. also exhibited second best activity of xylanase. Compost prepared with *Staphylococcus* sp. exhibited highest colony forming units of bacteria, numbers of mushroom pinheads and mushroom yield. Thus *Staphylococcus* sp. has potential to convert agro wastes into selective and productive compost for white button mushroom cultivation.

O P Ahlawat & B Vijay

- 956 Formulation and quality assessment of instant dhokla mix with incorporation of pumpkin flour**

This study presents an instant *dhokla* mix with incorporation of pumpkin (*Cucurbita moschata*) flour at 10, 20 and 30% levels in instant mix. Incorporation of pumpkin powder in instant *dhokla* mix resulted in a significant increase in nutrients (threefold increase in protein and twofold increase in fiber). Beta-carotene levels of *dhokla* mix increased by 8.4% in 20% pumpkin flour incorporated *dhokla* mix when compared to standard.



Usha Ravi, Lakshmi Menon & M Anupama

- 961 A new approach for jute industry to produce fancy blended yarn for upholstery**

This study presents a new approach to make jute based yarn by blending polypropylene in jute (30:70) in jute finisher drawing. Fabric has been made in specially modified handloom. Developed fabric showed higher area density, thickness, and weft crimp, tenacity and rigidity and it was cheap than commercial fabric. It was dimensionally and quality wise stable after wash, and showed no visible deterioration or deformation including surface texture, when used as table cloth and bed cover for two months.

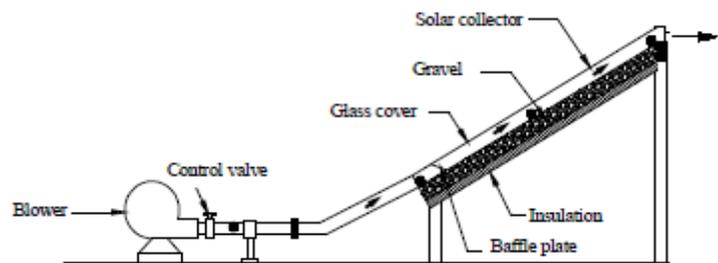


Surajit Sengupta & Sanjoy Debnath

Energy and Environment

966 Forced convection flat plate solar air heaters with and without thermal storage

This paper presents thermal performance of flat plate solar air heater (SAH) with and without thermal storages. A forced convection solar collector (FCSC) integrated with different sensible heat storage material has been developed and tested for its performance for solar collector under meteorological conditions of Aliyar, Pollachi Taulk, India. System consists of a flat plate SAH with heat storage unit, and a centrifugal blower to increase collector outlet temperature and efficiency (10-20%). Gravel with iron scraps gives better efficiency than other storage materials. FCSC is more suitable for drying high quality dried product even in a cloudy climate like Pollachi.



P T Saravanakumar & K Mayilsamy

Author-Reader Platform

969 Annual Author Index 2010

974 Annual Keyword Index 2010

981 List of Referees

983 Instructions to contributors

Author Index

Ahlawat O P	948	Menon L	956
Anupama M	956	Milosawlewitsch-Aliaga M	930
Barba de la Rosa A P	942	Mohapatra S P	913
Čapko D	937	Nanda S	913
Chang H H	926	Osorio C	906
Chaudhary A K	901	Osornio-Rios R A	919, 930
Chen K K	926	Palchaudhary A	913
Chiu Y S P	926	Patnaik S C	913
Debnath S	961	Ravi Usha	956
Erdeljan A	937	Rivera-Guillen J R	919
Garcia-Perez A	919	Romero-Gómez S	942
González-Chavira M M	942	Romero-Troncoso R J	919, 930
Guevara-González R G	942	Sahoo S K	913
Guevara-Olvera L	942	Saravanakumar P T	966
Hembram P	913	Sarkar P K	901
Jiménez-Espinoza F	942	Sengupta S	961
Lain S	906	Torres-Pacheco I	919, 942
Lendak I	937	Vijay B	948
León-Galván F	942	Vukmirovic S	937
Mayilsamy K	966		

Keyword Index

<i>Agaricus bisporus</i>	948	Modeling	930
Algebraic approach	926	Motion dynamics	919
<i>Aspergillus niger</i>	942	Multiple deliveries	926
Bacteria	948	Nanocrystal	901
Bengal gram flour	956	Nanoparticles	901
Bhasma	901	Numerical simulation Turbulence model	906
cDNA cloning	942	OPC Unified Architecture (UA)	937
Closed loop output error model	930	PID controller	930
Common Information Model (CIM)	937	Polypropylene	961
Compost	948	Preferential blending	961
Continuous casting	913	Pumpkin flour	956
<i>Dhokla</i>	956	Ready to eat food	956
Economic production lot size	926	Replenishment policy	926
Extracellular lignocellulolytic enzyme activity	948	Rework	926
Fabric	961	Scrap	926
Finite elements method	913	Sensible heat	966
Flank wear	919	Simulation	913
Flat plate solar air heater	966	Smart metering	937
Guanajuato isolate	942	Solidification	913
Herbo-metallic	901	Tannase	942
Herbo-mineral	901	Temperature distribution	913
Home textiles	961	Thermal storage	966
Hydrodynamics	906	Tool life	919
Industrial process	930	Vertical axis water turbine	906
Iterative feedback tuning	930	White button mushroom	948
Jerk	919	Yarn	961
Jute	961		

