



IN THE NAME OF ALLĀH,
THE MERCIFUL,
THE MERCY-GIVING

KINGDOM OF SAUDI ARABIA

Ministry of Higher Education

KING ABDULAZIZ UNIVERSITY

Faculty of Science



**Scientific Articles of Faculty of Science,
Published in cited (IF) Journals
during 2009**

Prepared by:

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Preface

The Faculty of Science is the main contributor of scientific research at the King Abdulaziz University, Jeddah, Saudi Arabia. Publishing a large number of research articles and theses annually, by its faculty and students, has positioned the college in the lead.

Through this catalogue, the College is pleased to present abstracts of a selection of scientific articles published by its faculty members during the year 2009. All included articles have been published in highly reputable international journals.

This issue is the third of an annual series the College has produced in an effort to avail part of its research body to scientists and to guide them to any articles of interest.

I would like to thank my colleagues at the Faculty of Science for their outstanding world-class contribution to scientific research. I also would like to take the opportunity to thank all those who have participated in producing this valuable document.

Wishing that you find this issue of great use,

Sincerely,

Professor Abdullah Y. Obaid

Dean of Faculty of Science.

Research Records
Faculty of Science - King Abdulaziz University
In **2009**

Number of papers: 199 articles

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El-Sawi, N.M., Al-Seeni, M.N.

Assessment of flavonoids as rutin for detoxification of T-2 toxin
(2009) *Journal of Applied Animal Research*, 35 (1), pp. 57-60.

Biochemistry Department, Faculty of Science, King Abdulaziz University, Jeddah, 21551-42805, Saudi Arabia

Abstract

To assess the efficacy of rutin, a flavonoid, for detoxifying T-2 toxin, 30 male albino rats were divided in 3 equal groups. Group 1 served as control. Rats in groups 2 and 3 were given 0.1 mg/kg bw T-2 toxin and those of group 3 were given 50 mg/kg rutin additionally. Toxin in liver tissue increased TBARS, SOD, GST, total lipids and decreased total thiol and catatase. Similarly there was increased lipid peroxide and decrease in total thiol, GST, hemoglobin and hematocrit value. All these were improved in group 3. The result suggest that rutin may be used as anti oxidant for T-2 toxin in liver of rat. © GSP.

Author Keywords

Antioxidants; Hemoglobin; Liver; Mycotoxin T-2 toxin; Rutin; Serum; Trichothecene

Mokhtar, M.^{a b}, Kadi, M.W.^b

Physicochemical and texture properties of nanocrystalline ZnCo 2O4 spinel and effect of γ -irradiation on its sintering process

(2009) *Materials Technology*, 24 (2), pp. 100-104. Cited 2 times.

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Abstract

Hydrozincite and spherocobaltite phases were obtained by coprecipitation of a mixture of zinc and cobalt nitrates using NaHCO₃ at 60°C and pH=8. The solid precursor obtained was calcined in air at 400-800°C. The precursor and ZnCo₂O₄ were also exposed to γ -ray doses of 0.4, 0.8 and 1.6 MGy. A nanostructured ZnCo₂O₄ spinel was obtained after calcination. X-ray diffraction analysis showed that the cubic ZnCo₂O₄ phase was thermally stable in the temperature range 400-800°C. The grain size of the ZnCo₂O₄ phase was found to increase with increasing calcination temperature and γ -ray dose. X-ray diffraction results and SEM confirmed that γ -irradiation has a marked effect on grain growth. Total surface area SBET of the solid precursor was found to increase with increasing γ -ray dose owing to the creation of new pores. A marked decrease in SBET was observed after calcining at 400-800°C or after exposure to γ -rays. The decrease in SBET can be explained in terms of increasing crystallite size. © 2009 W. S. Maney & Son Ltd.

Author Keywords

Hydrozincite; Irradiation effects; Nanosized; Specific surface area; XRD; ZnCo₂O₄

Ahmad, B.^a, Graef, J.R.^b

Coupled systems of nonlinear fractional differential equations with nonlocal boundary conditions

(2009) *Panamerican Mathematical Journal*, 19 (3), pp. 29-39.

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Abstract

In this paper, the authors study a coupled system of nonlinear Caputo type fractional differential equations with nonlocal boundary conditions in a Banach space. Applying Schauder fixed point theorem, an existence result is proved for the following system.

Author Keywords

Caputo fractional derivative; Coupled system; Existence; Fractional differential equations; Nonlocal boundary conditions; Schauder fixed point theorem

Ahmad, K.E.^a, Jaheen, Z.F.^{a b}, Mohammed, H.S.^a

Finite mixture of Burr type XII distribution and its reciprocal: properties and applications

(2009) *Statistical Papers*, pp. 1-11. Article in Press.

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Abstract

In this paper, the finite mixture of Burr type XII distribution with its reciprocal, is proposed as a failure model. The

failure rate (FR) of the new model covers several types of failure rates. It is shown that depending on the parameter values, the model is capable of covering different combinations of failure rates. A study of the behavior of the FR curve of the model is made. © 2009 Springer-Verlag.

Author Keywords

Burr type III; Burr type XII; Failure rate; Mixture distribution

in Press

El-Sebaili, A.A., Yaghmour, S.J., Al-Hazmi, F.S., Faidah, A.S., Al-Marzouki, F.M., Al-Ghamdi, A.A.

Active single basin solar still with a sensible storage medium

(2009) *Desalination*, 249 (2), pp. 699-706.

Physics Department, Faculty of Science, King Abdul Aziz University, P. O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

Transient mathematical models are presented for an active single basin solar still (ASS) with and without a sensible storage material under the basin liner of the still. Sand is used as a storage material due to its availability. The flowing water temperature is assumed to vary with time and space coordinates. Analytical expressions are obtained for various temperatures of the still elements as well as for the temperature of sand. The performance of the still with and without storage is investigated by computer simulation using the climatic conditions of Jeddah (lat. 21° 42' N, long. 39° 11' E), Saudi Arabia. Effects of mass flow rate and thickness of the flowing water for different masses of the storage material on the daylight Pdl, overnight Pon and daily productivity Pd and efficiency η_d of the still are studied. The dependence of Pd and η_d on the thickness and thermal conductivity of the basin liner material is also investigated. It is found that Pd and η_d decrease as the mass of the storage material increases, due to the increased heat capacity of the storage material. Furthermore, Pd and η_d are found to decrease with increasing thermal conductivity of the basin linear material. Therefore, it is advisable to fabricate basin liners of ASS from cheap insulating materials such as glass and mica with an optimum thickness of 3 mm. On a summer day, a value of Pd of 4.005 (kg/m² day) with a daily efficiency of 37.8% has been obtained using 10 kg of sand compared to 2.852 (kg/m² day) with a daily efficiency of 27% when the still is used without storage. The annual average of daily productivity of the still with storage is found to be 23.8% higher than that when it is used without storage. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Active single basin solar still; Solar stills; Still productivity; Storage material

Pathak, H.K.^a, Shahzad, N.^b

Fixed point results for generalized quasicontraction mappings in abstract metric spaces

(2009) *Nonlinear Analysis, Theory, Methods and Applications*, 71 (12), pp. 6068-6076.

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Abstract

In this paper, we introduce the concept of generalized quasicontraction mappings in an abstract metric space. By using this concept, we construct an iterative process which converges to a unique fixed point of these mappings. The result presented in this paper generalizes the Banach contraction principle in the setting of metric space and a recent result of Huang-Zhang for contractions. We also validate our main result by an example. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

Cone metric space; Generalized quasicontraction mapping

Elroby, S.A.K.^a, Noamaan, M.A.^b, Shibl, M.F.^b

Quantum mechanical studies of the protonation and N-Br bond dissociation of the biologically important N-bromosuccinimide

(2009) *Journal of Molecular Structure: THEOCHEM*, 915 (1-3), pp. 93-97.

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^b Chemistry Department, Faculty of Science, Cairo University, Cairo, Egypt

Abstract

N-Bromosuccinimide (NBS) is a brominating and oxidizing agent that is used as a source of bromine. The proton affinities, the tautomeric forms and N-Br bond dissociation of NBS have been computed using the B3LYP functional as implemented in the density functional approach. The electronic structures of all possible tautomeric forms

of NBS have been thoroughly investigated. The keto form of NBS has been shown to be more stable than any other tautomeric forms. The geometries and relative energies for various stationary structures were determined. The results indicate clearly that O-site protonation is strongly favored over N-site protonation for the studied compound in case of mono- and di-protonation. The bond dissociation energies (BDEs), involving the formation of the bromine radical, cation, and anion, of the N-Br bond have been investigated. The N-Br BDE of the Br radical formation is lower than that of the Br anion or cation. These conclusions are in good agreement with the experimental results. © 2009 Elsevier B.V.

Author Keywords

BDE; DFT; NBO; NBS; Proton affinity

Mostafa, K.M.^a, Samarkandy, A.R.^b, El-Sanabary, A.A.^c

Synthesis and characterization of (poly (N-vinyl formamide)-pregelled starch-graft copolymer

(2009) *Journal of Polymer Research*, pp. 1-12. Article in Press.

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^c Polymers and Pigment Department, National Research Center, Dokki, Cairo, Egypt

Abstract

Bromate / cyclohexanone redox system was investigated as a novel initiator for graft copolymerization of N-vinyl formamide onto pregelled starch. A number of variables in the grafting reaction were investigated including N-vinyl formamide, cyclohexanone, bromate ion, sulphuric acid and pregelled starch concentrations, material to liquor ratio along with polymerization time and temperature. The graft copolymers were evaluated in terms of graft yield, graft reaction efficiency and homopolymer formation (%). The optimum conditions for grafting of N-vinyl formamide onto pregelled starch are: N-vinyl formamide 50% based on weight of substrate, cyclohexanone 15 mmol / l, bromate ion, 30 mmol / l, liquor ratio 10, pH 6, time 120 min., and temperature 40°C. On the other hand, characterizations of the resultant copolymers with respect to swelling capacity, solubility %, metal ion up-take and suitability as a sizing agent for cotton textiles were investigated. The results obtained reflect that, the resultant copolymer shows better results for the aforementioned properties in comparison with that obtained from native pregelled starch as a starting substrate.

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Author Keywords

Heavy metal removal; N-vinyl formamide; Potassium bromate / cyclohexanone; Pregelled starch; Solubility %; Swelling capacity

in Press

Khan, Z., Al-Tnabaiti, S.A., El-Mossalamy, E.H., Obaid, A.Y.

Effect of macromolecule poly(vinyl alcohol) on the growth of cetyltrimethylammonium bromide stabilized Ag-nanoparticles

(2009) *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 352 (1-3), pp. 31-37.

Department of Chemistry, Faculty of Science, King Abdul Aziz University, P.O. Box 80203, Jeddah, 21413, Saudi Arabia

Abstract

The kinetics of cetyltrimethylammonium bromide stabilized silver nanoparticles was studied spectrophotometrically in the absence and presence of poly(vinyl alcohol) (PVA). Silver nanoparticles were prepared in aqueous solution using silver nitrate and cysteine as oxidant and reductant, respectively. Size and the distribution of the particles were determined by transmission electron microscopy. Silver nanoparticles were spherical, aggregated, cross-linking and of uniform particle size (the average particle size was about 30 and 7 nm in absence and presence of PVA, respectively). At higher concentration of PVA, the formation of silver sol was not observed for a certain reaction time, i.e., 200 min. Silver sol formation follows zero-order kinetics with respect to $[Ag^{+}]$. Viscosity of the CTAB-PVA mixture was also determined. A mechanism that involves simultaneous formation of cysteine-Ag complex has been proposed.

© 2009.

Author Keywords

CTAB; Cysteine; Inhibitory role of PVA; Silver nanoparticles; TEM

Asiri, A.M., Khan, S.A.

2,6-bis(9-ethyl-9H-carbazolylmethylene)cyclohexanone

(2009) *MolBank*, 2009 (4), pp. 1-3.

Chemistry Department, Faculty of Science, King Abdul Aziz University, P.O. Box 80203, Jeddah 21413, Saudi Arabia

Abstract

The title compound, 2,6-bis(ethyl-9-ethyl-9H-carbazolylmethylene)cyclo-hexanone has been synthesized by

condensation of 9-ethylcarbazole-3-aldehyde and cyclohexanone in ethanol in the presence of pyridine. The structure of this new compound was confirmed by elemental analysis, IR, ¹H NMR, ¹³C NMR and EI-MS spectral analysis. © 2009 by the authors.

Author Keywords

Carbazole aldehyde; Cyclohexanone; Knoevenagel condensation

Asiri, A.M., Khan, S.A.

(2E,2'E)-3,3-(1,4-phenylene)bis[1-(2,5-dimethyl-3-thienyl)prop-2-en-1-one]

(2009) *MolBank*, 2009 (4), pp. 1-3.

Chemistry Department, Faculty of Science, King Abdul Aziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

A bis-chalcone has been synthesized by reaction of 3-acetyl-2,5-dimethyl-thiophene and terephthalaldehyde in ethanolic NaOH at room temperature: (2E,2'E)-3,3-(1,4-phenylene)bis[1-(2,5-dimethyl-3-thienyl)prop-2-en-1-one] (3) was obtained in high yield. The structure of this compound was established by elemental analysis, IR, ¹H NMR, ¹³C NMR and EI-MS spectral analysis. © 2009 by the authors.

Author Keywords

Aldol condensation; Chalcone; Terephthalaldehyde

Al-Hazmi, F.S.^a, Siddiqui, K.A.^a, Al-Zahrani, A.Z.H.^b

A molecular theoretic approach to GaN

(2009) *International Journal of Nano and Biomaterials*, 2 (1-5), pp. 425-430.

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Abstract

Gallium nitride is one of the most important semi-conductor material and a possible candidate for nano-electronic devices. Gallium nitride layers are getting importance towards the possible application for nanotechnology. A molecular theoretic approach is given here for the band structure calculations of gallium nitride structures. One of the main objectives of this work is to study the excitation of surface plasmon and to show how surface plasmon can be exploited by the experimentalists to understand the properties of nanomaterials. Copyright © 2009 Inderscience Enterprises Ltd.

Author Keywords

Gallium nitride; Surface plasmon

Zenkour, A.M.^a, Mashat, D.S.^b

Bending analysis of a ceramic-metal arched bridge using a mixed first-order theory

(2009) *Meccanica*, 44 (6), pp. 721-731.

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Abstract

In this research, the bending analysis of an arched bridge is presented based on a mixed first-order thick beam one dimensional plate theory. The present arched bridge is considered as a beam with boundary conditions at its edges, which may be simply-supported, and between these two edges, the beam may have quadratic thickness variation. The bridge consists of two layers; the upper flat one is made from an isotropic homogeneous material such as ceramic, and the lower arched layer is made from an isotropic non-homogeneous functionally graded ceramic-metal material. The upper-surface of the arched layer, which represents the interface between the two layers, is ceramic-rich material while the lower-surface of the arched layer is metal-rich material. This structure eliminates interface problem of the arched bridge and thus the stress distributions are smooth. A closed form solution is developed for the static response of such bridge subjected to different distributed loads. The effects of many parameters on the displacements and stresses are investigated. The sample numerical examples presented herein for bending response of the present arched bridge should serve as references for future comparisons. © 2009 Springer Science+Business Media B.V.

Author Keywords

Arched bridges; Beam with variable cross-section; Bending response; Functionally graded material

Shah, M.A.^a, Al-Shahry, M.S.^b, Asiri, A.M.^c

Biomedical applications of iron oxide nanostructures

(2009) *International Journal of Nano and Biomaterials*, 2 (1-5), pp. 164-172.

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Abstract

Iron oxide nanostructures including nanoparticles and nanorods have been widely used for numerous in vivo and vitro applications such as magnetic resonance imaging contrast enhancement, tissue repair and drug delivery. All these biomedical and bioengineering applications require that these nanostructures have high magnetisation values and size smaller than 100 nm with overall narrow particle size distribution. In addition, these applications need that the nanostructures have to be not only biocompatible but also non-toxic. To this end, the authors present a versatile approach for the synthesis of iron oxide nanostructures without organics/amines. Pure water is used as a solvent. The authors' simple and straightforward approach will enhance and improve the biomedical applications of these nanostructures. The method is absolutely new, cheap, environmentally benign and bio-friendly, which will make it suitable for large scale production. Copyright © 2009 Inderscience Enterprises Ltd.

Author Keywords

Characterisation; Iron metal; Nanoparticles; Simple synthesis

Al-Zahrani, A.O., Al-Ahmadi, M.S.G., Siddiqui, K.A.

DNA and genetic code: A candidate for nano devices

(2009) *International Journal of Nano and Biomaterials*, 2 (1-5), pp. 431-436.

Department of Physics, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract

The last century has witnessed a tremendous miniaturisation of electronic devices and nanotechnology. Biomolecules like DNA are the likely candidates for nanodevices. Molecular recognition, programmability, self assembling capabilities and biocompatibility are some unique features of DNA. DNA based nanotechnology exploit the properties and symmetries of DNA and the genetic code. In the present paper, we discuss the Lie algebraic and an equivalent spin space approach to understand the physics and symmetries of DNA and the genetic code. Copyright © 2009 Inderscience Enterprises Ltd.

Author Keywords

DNA based devices; DNA nanotechnology; DNA physics; Genetic code symmetries

El-Nahass, M.M.^a, El-Zaidia, E.F.M.^a, Yaghmour, S.^b

Effect of gamma irradiation on the optical properties of nano-MgPc thin films

(2009) *International Journal of Nano and Biomaterials*, 2 (1-5), pp. 31-41.

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^b Department of Physics, Faculty of Science, King Abdulaziz University, P.O. Box 80186, Jeddah 22589, Saudi Arabia

Abstract

The thermal evaporation technique was used to deposit MgPc thin films. XRD and TEM studies were carried out for MgPc thin films. The effects of γ -radiation on the optical properties of MgPc thin films were characterized by using spectrophotometric measurements of the transmittance and reflectance in the spectral range from 200 nm to 2500 nm. The absorption spectra recorded in the UV-Vis region for as-deposited and radiated films showed two well-defined absorption bands of phthalocyanine molecule, namely the Q-band and the Soret (B) band. The Q-band showed its characteristic splitting (Davydov splitting) and ΔQ was obtained as 0.17 eV. The refractive index, n and the absorption index, k , were calculated. According to the analysis of dispersion curves, the parameters, namely; the dispersion energy (E_d), the oscillator energy (E_o) and the dielectric constant at infinite wavelength ϵ_∞ . Some of the important optical absorption parameters such as the molar extinction coefficient (ϵ_{molar}), the oscillator strength, (f) and the electric dipole strength ($q_{>2</sup>}$) of the principle optical transitions were evaluated. The analysis of the spectral behaviour of the absorption coefficient (α), in the absorption region revealed indirect transitions. The optical and the onset respectively energy gaps were estimated as 2.74 and 1.33. Copyright © 2009 Inderscience Enterprises Ltd.

Author Keywords

Effects of γ -irradiation; MgPc thin films; Optical properties

El-Sebaili, A.A., Al-Amir, S., Al-Marzouki, F.M., Faidah, A.S., Al-Ghamdi, A.A., Al-Heniti, S.

Fast thermal cycling of acetanilide and magnesium chloride hexahydrate for indoor solar cooking
(2009) *Energy Conversion and Management*, 50 (12), pp. 3104-3111.

Physics Department, Faculty of Science, King Abdul Aziz University, P.O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

Solar cookers are broadly divided into a direct or focusing type, indirect or box-type and advanced solar cookers. The focusing and box-type solar cookers are for outdoor applications. The advanced solar cookers have the advantage of being usable indoors and thus solve one of the problems, which impede the social acceptance of solar cookers. The advanced type solar cookers are employing additional solar units that increase the cost. Therefore, the solar cooker must contain a heat storage medium to store thermal energy for use during off-sunshine hours. The main aim of this study is to investigate the influence of the melting/solidification fast cycling of the commercial grade acetanilide C₈H₉NO (T_m = 116 °C) and magnesium chloride hexahydrate MgCl₂·6H₂O (T_m = 116.7 °C) on their thermo-physical properties; such as melting point and latent heat of fusion, to be used as storage media inside solar cookers. Five hundred cycles have been performed. The thermo-physical properties are measured using the differential scanning calorimetric technique. The compatibility of the selected phase change materials (PCMs) with the containing material is also studied via the surface investigation, using the SIM technique, of aluminum and stainless steel samples embedded in the PCM during cycling. It is inferred that acetanilide is a promising PCM for cooking indoors and during low intensity solar radiation periods with good compatibility with aluminum as a containing material. However, MgCl₂·6H₂O is not stable during its thermal cycling (even with the extra water principle) due to the phase segregation problem; therefore, it is not recommended as a storage material inside solar cookers for cooking indoors. It is also indicated that MgCl₂·6H₂O is not compatible with either aluminum or stainless steel. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

Acetanilide; Compatibility; Phase change materials; Salt hydrates; Thermal cycling

Ahmed, G.A.-R.^a, Khorshid, F.A.R.^b, Kumosani, T.A.^c

FT-IR spectroscopy as a tool for identification of apoptosis-induced structural changes in A549 cells treated with PM 701

(2009) *International Journal of Nano and Biomaterials*, 2 (1-5), pp. 396-408.

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^c Biochemistry Department, Faculty of Science, King Abdulaziz University, P.O Box 80203, Jeddah 21589, Saudi Arabia

Abstract

Fourier transform infrared (FTIR) spectroscopy has been found useful for detecting apoptotic changes induced in human lung cancer cells (A549) that treated with PM 701 (natural product) in tissue culture level. Characteristic bands alterations were identified in the apoptotic cells arising from cellular protein, lipid and DNA, there were specific changes that affected the secondary structure of proteins in the apoptotic lung cells appeared in the FTIR spectra confirmed with the second derivative analysis. To follow the induced changes in the apoptotic A549 cells, different band absorbance ratios were calculated for different times up to 24 hours. The results show that there is a marked decrease in the phosphate absorbance ratio from nucleic acids, the minimum value was observed at five minutes of PM 701 treatment meanwhile there is a sharp increase in the lipid-protein ratio the maximum value was obtained for cells treated at five minutes with PM 701. This study suggests that FTIR spectroscopy could possibly be used to monitor apoptosis in A549 cells and prove the efficiency of our new drug PM 701 in cancer treatment. Copyright © 2009 Inderscience Enterprises Ltd.

Author Keywords

A549 cells; Apoptosis; FTIR spectroscopy; Quantitative analysis; Structural changes

El-Shishtawy, R.M.^{a b}

Functional dyes, and some hi-tech applications

(2009) *International Journal of Photoenergy*, 2009, art. no. 434897, .

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Abstract

An overview of the recent developments in functional dyes, which are useful for hi-tech applications for those based on optoelectronics, such as dye sensitized solar cells, photochromic dyes and biomedical applications, such as photodynamic therapy for the treatment of cancer and fluorescent sensors is presented. Copyright © 2009 Reda M. El-Shishtawy.

Raouf, G.A.^a, Elkhateeb, W.F.^a, Toumah, H.^a, Quari, M.^a, Jaouni, S.^a, Elkebbba, K.^a, Kumosani, T.A.^b
Infrared spectroscopy of human bone marrow: Evidence of structural changes during acute leukemia
(2009) *International Journal of Nano and Biomaterials*, 2 (1-5), pp. 289-298.

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Abstract

Fourier transform infrared (FTIR) spectroscopy was explored as a means to distinguish newly diagnosed of acute lymphoblastic leukemia from disease free bone marrow samples. Characteristic bands alterations were identified in both healthy and diseased samples arising from cellular protein, lipid and DNA. There were specific changes that affected the secondary structure of proteins that appeared in the FTIR spectra and confirmed with the second derivative analysis. The overall protein structure in the control sample consists primarily of α -helix, whereas in ALL sample it has a relatively high proportion of anti-parallel β -sheet protein constituents presumably due to leukemia. Different absorbance's ratios for specific bands were calculated and plotted versus the patient samples. There are significant fluctuations in the ratios under investigation which can be attributed to the changes in the biomolecular structure between normal and leukemia samples. Our results indicate that the absorbance of amide A and B are in the range 3,340-3,000, the lipid/protein ratio and the phosphate/amide II ratio are all yielding statistically significant differences parameters, that it can be used as a biomarker in differentiating acute leukemia from leukemia free bone marrow. Copyright © 2009 Inderscience Enterprises Ltd.

Author Keywords

Acute lymphoblastic leukaemia; ALL; Bone marrow; FTIR spectroscopy; Quantitative analysis; Structural changes

Khan, Z.H.^{a b}, Khan, S.^c, Husain, M.^c, Salah, N.^a, Habib, S.^a, Khan, S.A.^d
J-E characteristics of Ni-catalysed multiwalled carbon nanotubes
(2009) *International Journal of Nano and Biomaterials*, 2 (1-5), pp. 226-233.

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Abstract

A catalytic decomposition of hydrocarbons involving N₂, C₂H₂ and H₂ gas mixtures is used to synthesise the Ni catalysed carbon nanotubes (CNTs). These CNTs are grown on nanocrystalline film of nickel using low-pressure chemical vapour deposition (LPCVD). During the synthesis of these nanotubes, the growth temperature and growth time is kept at 700°C and 30 minutes respectively. The pressure in LPCVD chamber is maintained at 10 Torr. FESEM and HRTEM are employed to study the growth mechanism of these as grown CNTs. FESEM images suggest that these CNTs are very long and their diameter varies from 10-50 nm. It is also confirmed from HRTEM image that these nanotubes are multiwalled with the diameter varying from 10-50 nm and length of several micrometers. It is clear from SEM mage that the inner and outer tube diameter of these CNTs is 5 nm and 12 nm respectively. On the basis of J-E characteristics, it is observed that these multiwalled carbon nanotubes (MWNTs) show a turn-on field of 6.23V/ μ m, when the current density achieves 5 μ A/cm² and the field enhancement factor is estimated to be 5.41 × 10⁶ cm⁻¹. Copyright © 2009 Inderscience Enterprises Ltd.

Author Keywords

Catalytic decomposition; CNTs; FESEM; Field emission scanning electron microscope; Field enhancement factor.; High resolution transmission electron microscope; HRTEM; J-E characteristics; Ni catalysed carbon nanotubes; Turn-on field

Kharal, A.^a, Ahmad, B.^b

Mappings on fuzzy soft classes

(2009) *Advances in Fuzzy Systems*, art. no. 407890, .

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Abstract

We define the concept of a mapping on classes of fuzzy soft sets and study the properties of fuzzy soft images and fuzzy soft inverse images of fuzzy soft sets, and support them with examples and counterexamples. Copyright © 2009 A. Kharal and B. Ahmad.

Abu-Zinadah, O.A.H.^a, El-Hamidy, S.M.^a, Refaat, N.A.A.^b

Mesoscopic studies on toxic effect of doxorubicin on rat cardiac muscles

(2009) *International Journal of Nano and Biomaterials*, 2 (1-5), pp. 386-395.

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Abstract

The anthracycline antibiotic doxorubicin (DOX) is one of the most effective anti-tumour agents used to treat human malignancies. Long-term treatment with DOX is limited by its cardiotoxicity. The purpose of the present study was to evaluate the cardiotoxic effect of DOX using nanoscale. Twelve adult male rats were divided into two groups: control group, group 2A, DOX one week (DOX 1wk), group 2B, DOX two weeks (DOX 2wk). Ultrastructural damage using mesoscopic studies showed cardiomyocytes injury after one week and more pronounced after two weeks by increase in thickness of thick myosin filaments (22 nm to 25 nm) and widening of interfilaments spaces (4 nm to 8 nm). In addition to the changes in the mitochondria being the most extensively and progressively injured organelle such as swelling, disorganisation of cristae, vacuolisation to degeneration and complete loss of mitochondrial cristae. The thickness of cristae measured by mesoscopic scale range from 25 nm to 31 nm and spaces vary between 22 nm to 28 nm especially after two weeks of DOX injection. Copyright © 2009 Inderscience Enterprises Ltd.

Author Keywords

Cardiac muscle; Cristea; DOX; Doxorubicin; Mesoscopic; Mitochondria; Thick myosin filament; Toxic effect; Ultrastructure

Hussain, S.^a, Ahmad, B.^{b c}

On γ -s*-regular spaces and almost γ -s-continuous functions

(2009) *Lobachevskii Journal of Mathematics*, 30 (4), pp. 263-268.

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Abstract

In this paper, we define a new axiom called γ -s*-regularity. It is interesting to mention that this axiom is a generalization of the axiom of s-regularity [11] as well as semi-regularity [4]. We also introduce and investigate the notion of almost γ -s-continuous functions. It will turn out that each of almost s-continuous functions [13] and almost γ -s-continuous functions are independent notions. © Pleiades Publishing, Ltd., 2009.

Author Keywords

γ^* -semi-closed (open); γ^* -semi-closure(interior); γ -closed(open); γ -closure; γ -regular(open); γ -s*-regular space; γ_0 -compact; Almost γ -s-continuous

Salah, N.^a, Habib, S.S.^a, Khan, Z.H.^a, Al-Ghamdi, A.A.^b

Optical properties of LiF:Mg,Cu,P nanorods

(2009) *International Journal of Nano and Biomaterials*, 2 (1-5), pp. 118-125.

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^b Department of Physics, Faculty of Science, King Abdulaziz University, Jeddah-21589, Saudi Arabia

Abstract

Nanorods of LiF:Mg,Cu,P synthesised by the chemical co-precipitation technique have been investigated for their optical properties. Photoluminescence (PL) emission and excitation spectra and UV-visible absorption spectrum have been investigated in this paper. PL emission spectrum shows a wide emission band located at the range 350 nm-450 nm along with emerging of a sharp intense band at 376 nm. Normally, a broad emission band is observed in the bulk (micro/single crystal) material of LiF:Mg,Cu,P which is due to Cu⁺ transition. The nanorods have sizes approximately 50 nm in diameter and several hundreds nm in length. The sharp band at 376 nm may be attributed to quantum confinement. Moreover, the result obtained from the UV-visible absorption measurement is consistent with the PL result. It shows a broad absorption band contains a small sharp one at around 373 nm. These remarkable results might be useful for some applications such as high power lasers. Copyright © 2009 Inderscience Enterprises Ltd.

Author Keywords

LiF:Mg,Cu,P; Nanorods; Photoluminescence; PL; UV-visible

Hassan, A.S.^{a, b}, Al-Ghamdi, A.S.^{a, b}

Optimum Step Stress Accelerated Life Testing for Lomax Distribution

(2009) *Journal of Applied Sciences Research*, 5 (12), pp. 2153-2164.

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Abstract

The optimal times of changing stress level for simple stress plans under a cumulative exposure model using the Lomax distribution are determined for a wide range of values of the model parameters. The scale parameter of the Lomax failure time distribution at constant levels is assumed to be a log linear function of the stress level. The optimum test plan is obtained by minimizing with respect to the change time, the asymptotic variance (AV) of the maximum likelihood estimator (MLE) of a given 50th percentile of the distribution at the design stress. Interval estimations that generate narrow intervals to the unknown parameters of the distribution with high probability are obtained. Also, tests of hypotheses about model parameters using the likelihood ratio method are examined. Numerical study is discussed to illustrate the optimal time procedure using Mathcad (2001). © 2009, INSInet Publication.

Author Keywords

Accelerated life tests; Cumulative exposure model; Lomax distribution; Maximum likelihood estimation; Simple step stress

Pandeeswaran, M.^a, EL-Mossalamy, E.H.^b, Elango, K.P.^a

Spectroscopic studies on the dynamics of charge-transfer interaction of pantoprazole drug with DDQ and iodine

(2009) *International Journal of Chemical Kinetics*, 41 (12), pp. 787-799.

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Abstract

Spectrophotometric method was used to study the kinetics of charge-transfer (CT) complexes of pantoprazole with 2,3-dichloro-5,6-dicyano-1,4-benzoquinone (DDQ) and iodine. The reactions of DDQ and iodine with pantoprazole have been investigated in different solvents at three different temperatures. The products of the interactions have been isolated and characterized using UV-vis, GC-MS, FT-IR, and far-IR spectral techniques. The rate of formation of the product has been measured and discussed as a function of solvents and temperature. The iodine complex indicates the formation of the tri-iodide CT complex with a general formula $[(PTZ)I]^{+}I_{3}^{-}$. The characteristic strong absorptions of I_{3}^{-} are observed around 360 and 290 nm in the electronic spectra, and the far-IR spectrum exhibits three characteristic vibrations of I_{3}^{-} unit at 156, 112, and 69 cm^{-1} assigned to $\nu(I-I)$, $\nu_s(I-I)$, and $\delta(I_{3}^{-})$, respectively. The activation parameters (ΔG^{\ddagger} , ΔS^{\ddagger} , and ΔH^{\ddagger}) were obtained from the temperature dependence of the rate constants. The influence of relative permittivity of the medium on the rate indicated that the intermediate is more polar than the reactants, and this observation was further well supported by spectral studies. Based on the spectrokinetic results, plausible mechanisms for the interaction of the drug with the chosen acceptors, which proceed via the formation of CT complexes and its transformation into final products, have been proposed. © 2009 Wiley Periodicals, Inc.

Balubaid, S.O.A.B.

Study the adverse effects of antibiotic maxipime (Cefepime hydrochloride) on the evolution of composition of the liver in albino rats during pregnancy and lactation

(2009) *Biosciences Biotechnology Research Asia*, 6 (2), pp. 455-464.

Department of Biology, Faculty of Science, King Abdul Aziz University, Jeddah, Saudi Arabia

Abstract

The aim of this study was to identify the impact of the new antibiotic "Maxipime" (Cefepime hydrochlorid) ", which belongs to cephalosporin group on the development of composition of the liver in fetuses, infants'white rats during pregnancy and lactation. Using Maxipime drug during the different phases of pregnancy, invagination (0-7 day), organs formation (7-14 day) and growth period (14-21 day) led to a lot of pathological changes in the fetal liver and these changes were obviously appeared in the first and second trimester. The histological examination of rat liver during lactation showed a decrease in the impact of the drug at the age of one week of lactation, and this effect restricted on limited areas at 14 days age and the liver with normal hepatic structure at the end of weaning age. It was evident in the low intensity of these effects during the lactation period in the histological sections of the maternal liver as restricted to limited areas, while included most of the liver tissue during pregnancy. Therefore, it is

recommended to: never provide Maxipime during gestation especially during the first and second period and treatment with Maxipime should not be used during lactation before the 14th day of delivery.

Author Keywords

Albino rats; Liver; Maxipime; Pregnancy and lactation

Al-Assiri, M.^a, Al-Gharni, H.^a, Alolah, A.^a, Al-Hajry, A.^b, Umar, A.^c, Vaseem, M.^c, Hahn, Y.-B.^c, El-Tantawy, F.^d, Bououdina, M.^e, Al-Heniti, S.^f

Synthesis and characterisation of ZnO structures containing the nanoscale regime

(2009) *International Journal of Nano and Biomaterials*, 2 (1-5), pp. 255-262.

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Abstract

Synthesis of ZnO nanorods assembled in flower-shaped spherical morphologies have been grown via solution process by using zinc nitrate hexahydrate (Zn(NO₃)₂ · 6H₂O) and sodium hydroxide (NaOH) at low-temperature of 100°C in eight hours. The grown ZnO structures were characterised in terms of their structural and optical properties. The detailed structural characterisations demonstrated that the synthesised products are single crystalline with the wurtzite hexagonal phase and grown along the [0001], c-axis direction. A strong absorption band at 480 cm⁻¹ was observed in Fourier transform infra red (FTIR) spectrum which was related with the ZnO. The optical property of the grown ZnO structures was observed by using UV-visible studies. Only a sharp peak at 371 nm was observed in the UV-vis. spectrum which is a characteristic band for the wurtzite hexagonal pure ZnO. Moreover, systematic time-dependent reactions were also performed to know the detailed growth process for the synthesised ZnO nanostructures. Copyright © 2009 Inderscience Enterprises Ltd.

Author Keywords

Fourier transform infra red; FTIR; High-resolution transmission electron microscopy; HRTEM; Optical properties.; UV-visible spectroscopy; ZnO

Cho, Y.J.^b, Hussain, N.^a

Weak contractions, common fixed points, and invariant approximations

(2009) *Journal of Inequalities and Applications*, 2009, art. no. 390634, .

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Abstract

The existence of common fixed points is established for the mappings, where T is (f,L)-weak contraction on a nonempty subset of a Banach space. As application, some results on the invariant best approximation are proved. Our results unify and substantially improve several recent results given by some authors. Copyright © 2009 N. Hussain and Y. J. Cho.

Zenkour, A.M.^{a c}, Allam, M.N.M.^b, Sobhy, M.^a

Bending analysis of FG viscoelastic sandwich beams with elastic cores resting on Pasternak's elastic foundations

(2009) *Acta Mechanica*, pp. 1-20. Article in Press.

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Abstract

The investigation of bending response of a simply supported functionally graded (FG) viscoelastic sandwich beam with elastic core resting on Pasternak's elastic foundations is presented. The faces of the sandwich beam are made of FG viscoelastic material while the core is still elastic. Material properties are graded from the elastic interfaces through the viscoelastic faces of the beam. The elastic parameters of the faces are considered to be varying according to a power-law distribution in terms of the volume fraction of the constituent. The interaction between the beam and the foundations is included in the formulation. Numerical results for deflections and stresses obtained using the refined sinusoidal shear deformation beam theory are compared with those obtained using the simple sinusoidal shear

deformation beam theory, higher- and first-order shear deformation beam theories. The effects due to material distribution, span-to-thickness ratio, foundation stiffness and time parameter on the deflection and stresses are investigated. © 2009 Springer-Verlag.

in Press

Kadi, M.W., El-Shahawi, M.S.

Differential pulse cathodic stripping voltammetric determination of uranium with arsenazo-III at the hanging mercury dropping electrode

(2009) *Radiochimica Acta*, 97 (11), pp. 613-620.

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Abstract

An accurate, inexpensive and less laborious controlled adsorptive accumulation of uranium(VI)-arsenazo-III on a hanging mercury drop electrode (HMDE) has been developed for uranium(VI) determination. The method is based upon the collection of uranium(VI)-arsenazo-III complex at pH 5-6 at the HMDE and subsequent direct stripping measurement of the element in the nanomolar concentration level. The cathodic peak current ($i_{p,c}$) of the adsorbed complex ions of uranium(VI) was measured at -0.35 V vs. Ag/AgCl reference electrode by differential pulse cathodic stripping voltammetry (DP-CSV), preceded by an accumulation period of 150s. The plot of the resulting $i_{p,c}$ vs. uranium(VI) concentration was linear in the range 2.1×10^{-9} to 9.60×10^{-7} mol L⁻¹ uranium(VI) and tended to level off at above 9.6×10^{-7} mol L⁻¹. The limits of detection and quantification of uranium(VI) were found to be 4.7×10^{-9} mol L⁻¹ and 1.5×10^{-9} mol L⁻¹, respectively. A relative standard deviation of $\pm 2.39\%$ ($n=5$) at 8.5×10^{-7} mol L⁻¹ uranium(VI) was obtained. The method was validated by comparing the results with that obtained by ICP-MS method with RSD less than $\pm 3.3\%$. The method was applied successfully for the analysis of uranium in certified reference material (IAEA soil-7), and in phosphate fertilizers. © by Oldenbourg Wissenschaftsverlag, München.

Author Keywords

Arsenazo-III; Cathodic stripping voltammetry; Chemical speciation; HMDE; ICP-MS; Phosphate fertilizers; Uranium(VI)

Mohamed, S.A.^{a, b}, Drees, E.A.^c, El-Badry, M.O.^b, Fahmy, A.S.^b

Biochemical Properties of α -Amylase from Peel of Citrus sinensis cv. Abosora

(2009) *Applied Biochemistry and Biotechnology*, pp. 1-12. Article in Press.

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^c Biochemistry division, Chemistry Department, Faculty of Science, Fayoum University, Fayoum, Egypt

Abstract

α -Amylase activity was screened in the peel, as waste fruit, of 13 species and cultivars of Egyptian citrus. The species Citrus sinensis cv. Abosora had the highest activity. α -Amylase AI from Abosora peel was purified to homogeneity using anion and cation-exchange, and gel filtration chromatographies. Molecular weight of α -amylase AI was found to be 42 kDa. The hydrolysis properties of α -amylase AI toward different substrates indicated that corn starch is the best substrate. The α -amylase had the highest activity toward glycogen compared with amylopectin and dextrin. Potato starch had low affinity toward α -amylase AI but it did not hydrolyze β -cyclodextrin and dextran. Apparent K_m for α -amylase AI was 5 mg (0.5%) starch/ml. α -Amylase AI showed optimum activity at pH 5.6 and 40 °C. The enzyme was thermally stable up to 40 °C and inactivated at 70 °C. The effect of mono and divalent metal ions were tested for the α -amylase AI. Ba^{2+} was found to have activating effect, where as Li^+ had negligible effect on activity. The other metals caused inhibition effect. Activity of the α -amylase AI was increased one and half in the presence of 4 mM Ca^{2+} and was found to be partially inactivated at 10 mM Ca^{2+} . The reduction of starch viscosity indicated that the enzyme is endoamylase. The results suggested that, in addition to citrus peel is a rich source of pectins and flavanoids, α -amylase AI from orange peel could be involved in the development and ripening of citrus fruit and may be used for juice processing. © 2009 Springer Science+Business Media, LLC.

Author Keywords

α -Amylase; Citrus sinensis cv. Abosora; Peel; Properties; Purification

in Press

Khan, V.A.^a, Khan, K.A.^b

Generic warped product submanifolds in nearly Kaehler manifolds

(2009) *Beitrage zur Algebra und Geometrie*, 50 (2), pp. 337-352.

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^b School of Engineering and Logistics, Faculty of Technology, Charles Darwin University, NT-0909, Australia

Abstract

Warped product manifolds provide excellent setting to model space-time near black holes or bodies with large gravitational force (cf. [1], [2], [14]). Recently, results are published exploring the existence (or non-existence) of warped product submanifolds in Kaehlerian and contact settings (cf. [6], [17], [20]). To continue the sequel, we have considered warped product submanifolds of nearly Kaehler manifolds with one of the factors a holomorphic submanifold. Such submanifolds are generic submanifolds in the sense of B. Y. Chen [5] and provide a generalization of CR and semi-slant submanifolds. It is shown that nearly Kaehler manifolds do not admit non-trivial warped product generic submanifolds, thereby generalizing the results of Chen [6] and Sahin [20]. However, non-trivial generic warped products (obtained by reversing the two factors of warped product generic submanifolds) exist in nearly Kaehler manifolds (cf. [21]). Some interesting results on the geometry of these submanifolds are obtained in the paper. © 2009 Heldermann Verlag.

Author Keywords

Generic warped products; Nearly Kaehler manifold; Semi-slant submanifold; Slant submanifold; Warped product

Zedan, H.A.

A study of the symmetry analysis for the Hirota-Satsuma equations

(2009) *Chaos, Solitons and Fractals*, 42 (3), pp. 1655-1663.

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Abstract

In this work, we present explicit Painleve test for Hirota-Satsuma equation. The invariance and integrability properties of Hirota-Satsuma equation are investigate. Furthermore, using Runge-Kutta-Merson in shooting and matching technique to solve the nonlinear ordinary differential equations which were converted from similarity reduction numerically. © 2009.

Gabal, M.A., Angari, Y.M.A.

Effect of chromium ion substitution on the electromagnetic properties of nickel ferrite

(2009) *Materials Chemistry and Physics*, 118 (1), pp. 153-160.

Chemistry Department, Faculty of Science, King Abdul Aziz University, Jeddah, Saudi Arabia

Abstract

Polycrystalline ferrites with general formula $NiFe_{2-x}Cr_xO_4$ ($0 \leq x \leq 1$) were prepared through oxalate impregnation method. The samples were characterized using DTA-TG, XRD, FT-IR, AC conductivity, VSM and magnetic susceptibility measurements. All compositions show cubic Spinel structure. Lattice constant slightly decreases with increasing chromium content. Average crystallite size lays in the range 147-170 nm. FT-IR studies show two absorption bands (ν_1 and ν_2) near about 600 cm^{-1} and 400 cm^{-1} for tetrahedral and octahedral sites, respectively. No shift was observed in band position at frequency ν_1 by increasing Cr content, meanwhile the frequency ν_2 is shifted to higher frequencies with increasing Cr content. AC conductivity measurements as a function of temperature showed that the samples behave like semiconductors. The decrease in the conductivity with increasing Cr content is due to limiting the degree of Fe^{2+} - Fe^{3+} conduction in the octahedral site by introducing Cr which has preference to substitute octahedral Fe^{3+} ions. The saturation magnetization decreases linearly with increasing Cr content, whereas coercivity increases. Néel's magnetic moments calculated from expected cation distributions in comparison with that from hysteresis loop gives satisfactory results up to $x = 0.8$. Magnetic susceptibility measurements revealed that all the samples have ferrimagnetic properties which changed to paramagnetic materials by increasing temperature. The Curie temperature and molar magnetic susceptibility were observed to decrease with increasing Cr content. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Conductivity; Magnetic susceptibility; $NiFe_{2-x}Cr_xO_4$; VSM; XRD

Hussain, N.^a, Khamsi, M.A.^b

On asymptotic pointwise contractions in metric spaces

(2009) *Nonlinear Analysis, Theory, Methods and Applications*, 71 (10), pp. 4423-4429.

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Abstract

We discuss the existence of fixed points of asymptotic pointwise mappings in metric spaces. This is the nonlinear version of some known results proved in Banach spaces. We also discuss the case of multivalued mappings. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

Asymptotic pointwise contraction mapping; Asymptotic pointwise nonexpansive mapping; CAT(0) spaces; Fixed point; Hyperconvex metric spaces; Multivalued mappings; Uniformly convex metric spaces

El-Shahawi, M.S.^a, Othman, A.M.^b, El-Houseini, M.E.^c, Nashed, B.^d, Elsofy, M.S.^d

Spectrofluorimetric method for measuring the activity of the enzyme α -l-fucosidase using the ion associate of 2-chloro-4-nitro phenol-rhodamine-B

(2009) *Talanta*, 80 (1), pp. 19-23.

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Abstract

A low cost and accurate method for the detection and analytical determination of the activity of the enzyme α -l-fucosidase (AFU) was developed. The method was based upon measuring the fluorescence intensity of the complex ion associate of the ion associate of rhodamine-B and the compound 2-chloro-4-nitrophenol (RB⁺+</sup> CNP⁻</sup>) at 580 nm in phosphate buffer (pH 5) against the reagent blank. The influence of the different parameters, e.g. pH, incubation time, temperature, 2-chloro-4-nitrophenol concentration, foreign ions and surfactants that control the fluorescence intensity of the produced ion associate was critically investigated. The correlation between the fluorescence activity of the enzyme AFU by the developed procedures and the standard method was positive and highly significant in patients and controls ($r^{>2</sup> = 0.99$, $p < 0.001$). The developed method is simple and proceeds without practical artifacts compared to the standard method. © 2009.

Author Keywords

α -l-Fucosidase enzyme; 2-Chloro-4-nitrophenol; Associate; Rhodamine-B

Hussain, N.^a, Berinde, V.^b, Shafqat, N.^c

Common fixed point and approximation results for generalized ϕ -contractions

(2009) *Fixed Point Theory*, 10 (1), pp. 111-124. Cited 1 time.

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^c Centre for Advanced Studies in Pure and Applied Mathematics, Bahauddin Zakariya University, Multan, Pakistan

Abstract

We establish common fixed point theorems for weakly compatible generalized ϕ -contractions. As applications, various common fixed point and best approximation results for C_q-commuting and compatible maps are derived. Our results unify, extend and complement various known results existing in the literature.

Author Keywords

C_q-commuting maps; Common fixed point; Comparison function ϕ ; Weakly compatible maps

Diery, W.A., Al-Ahmadi, M.S.G., Siddiqui, K.A.

A group theoretic treatment of f-electrons in endohedral fullerenes

(2009) *International Journal of Nanoparticles*, 2 (1-6), pp. 423-429. Cited 1 time.

Department of Physics, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract

The most abundant fullerene molecule, C₆₀, has just the right size, chemical stability and activity to host a large variety of atoms. Endohedrally doped fullerenes has been synthesised in the past. A rare earth doped fullerene shows an icosahedral symmetry. A group theoretic treatment of f-electrons in a strong icosahedral crystal field has been

discussed in the present study. This method shows a convenience over the conventional structures given by Racah for the treatment of f electrons in strong crystal fields. It is expected that it will make the perturbation calculations easier. These calculations will lead to an understanding of magnetic properties of nano devices. Copyright © 2009 Inderscience Enterprises Ltd.

Author Keywords

Endohedral fullerenes; F-electrons; Unitary group

Basahel, S.N., Thabaiti, S.A.A., Obaid, A.Y., Mokhtar, M., Salam, M.A.

Chemical modification of multi-walled carbon nanotubes using different oxidising agents: Optimisation and characterization

(2009) *International Journal of Nanoparticles*, 2 (1-6), pp. 200-208. Cited 1 time.

Chemistry Department, Faculty of Science, King Abdulaziz University, P.O. Box 80200, Jeddah 21589, Saudi Arabia

Abstract

Chemical modification of the multi-walled carbon nanotubes (MWCNTs) via oxidation was investigated. MWCNTs were oxidised using different oxidising agents, namely nitric acid/sulphuric acid, acidified potassium permanganate, and hydrogen peroxide. The selection of suitable oxidising agent was optimised depending on the integrity of the CNTs. The oxidised MWCNTs were able to suspend in water; with high stability, for a long period of time. FT-IR measurements showed the presence of carboxylic acid function groups especially for the MWCNTs oxidised with nitric acid and hydrogen peroxide. The texture analysis (specific surface area and pore size distribution) showed that oxidation of the MWCNTs led to a decrease in the specific surface area and as a result of introducing a new function groups at the MWCNTs surface which led to the collapse of the total pore volume. Scanning electron microscope images showed that the pristine MWCNTs are highly tangled tubes with diameters of 80-150 nm. Copyright © 2009 Inderscience Enterprises Ltd.

Author Keywords

Ft-ir; Multi-walled carbon nanotubes; Mwcnts; Oxidation; Pore size distribution; Scanning electron microscope; Sem

Al-Ghamdi, A.A.^a, Al-Heniti, S.^a, Salman, F.^b, Aal, N.A.^c, El-Mossalamy, E.H.^d, El-Tantawy, F.^{e,f}

Dielectric properties of bi-based superconductors nanoparticles filled natural rubber/low density polyethelene nanocomposites

(2009) *International Journal of Nanoparticles*, 2 (1-6), pp. 458-466. Cited 1 time.

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Abstract

A new nano conducting polymer composite containing natural rubber (NR) filled with Bi-based superconductor (BSCCO) nanoparticles was successfully fabricated using a traditional milling rubber technique. The scanning and transmission electron microscopic (SEM, TEM) studies provide information on quality of these samples and the uniform distribution of BSCCO particles within NR matrix. The electric conductivity and dielectric measurements have been carried out in the frequency range of 50 Hz-1 MHz and temperature range of 298-428 K. The measured impedance data were analysed on complex plane and the dc (bulk) as well as ac conductivity were obtained. Studies of dielectric constant as a function of frequency at different temperatures revealed that the compounds do not have any dielectric anomaly in the studied frequency and temperature range. The enhancement of the dielectric properties of nanocomposites makes it feasible as co-fired dielectric component devices. Copyright © 2009 Inderscience Enterprises Ltd.

Author Keywords

Conducting filler nanoparticles; Dielectric properties; Microstructure; Nanocomposites; Rubber matrix

Uddin, I.^a, Rafat, M.^a, Tripathi, K.^b, Husain, M.^b, Khan, S.A.^c, El-Hamidy, S.M.A.^d, Khan, Z.H.^{a,e}

Electrical transport properties of ZnO nanostructures

(2009) *International Journal of Nanoparticles*, 2 (1-6), pp. 81-88.

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Abstract

A physical vapour condensation method is used to synthesise the nanostructures of ZnO. These nanostructures are fabricated by resistive heating of Zn powder at a temperature of 400°C in the presence of oxygen and argon gases under a vacuum of order of 10⁻⁶ mbar. The transmission electron microscope (TEM) images suggest that these nanostructures have some mixed morphology. They contain nanorods as well as nanoparticles. The typical diameter of these nanorods is in the range of 80 nm to 150 nm and the length is of the order of several hundreds of nanometers, whereas the size of the nanoparticles varies from 50 nm to 80 nm. Temperature dependence of dc conductivity of these ZnO nanostructures is also studied in the temperature range (303 K to 573 K). It is found that the experimental data gives a good fit for thermally activated process. Therefore, it is suggested that thermally activated process is responsible for the transport in these nanostructures.

Author Keywords

Activation energy; DC conductivity; Nanoparticles; ZnO nanorods

Kazmi, S.S., Abou-Hajar, A.A.A., Al-Ahmadi, M.S.G., Siddiqui, K.A.

Magnetic structure of endohedral fullerenes

(2009) *International Journal of Nanoparticles*, 2 (1-6), pp. 451-457. Cited 1 time.

Department of Physics, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract

The fullerene molecule, C₆₀, has the capability to host a variety of atoms inside an icosahedral cage. Endohedrally doped fullerene structures are important to understand the behaviour of atoms with unfilled f shell. Electronic structure and magnetism of rare earth doped endohedral fullerenes with icosahedral symmetries are studied. A many body perturbation theory has been used to calculate the exchange interactions among the pairs of rare earth ions with two f-electrons. The ground multiplet of pairs is found to be non-magnetic. Possibilities of Raman transitions are also discussed. It is expected that the present approach will lead to an understanding of the magnetism of nano-materials. Copyright © 2009 Inderscience Enterprises Ltd, , .

Author Keywords

Endohedral fullerenes; Magnetic properties; Rare earth doped fullerenes

Mokhtar, M., Basahel, S., Thabaiti, S.A.

Modification of surface and catalytic properties of Cu nanostructure catalysts used in methanol synthesis and steam reforming

(2009) *International Journal of Nanoparticles*, 2 (1-6), pp. 156-163. Cited 1 time.

Department of Chemistry, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

A series of CuO/ZnO/Al₂O₃ nanocrystalline solid catalysts were prepared by the coprecipitation method at constant temperature. The effect of the change in pH, chemical composition and thermal treatment for all the prepared solids on the physicochemical, surface and catalytic properties was investigated. The crystal structure of the different prepared solids was studied using XRD analysis. The crystallite size calculated from XRD patterns using Scherer equation did not alter effectively by changing the pH of the prepared catalyst precursors. The surface characteristics of various calcined adsorbents were investigated using nitrogen adsorption at -196°C and their catalytic activities were determined using water-gas shift reaction (WGS) at temperature range between 130°C and 300°C. Only CuO and ZnO were identified for the solids calcined at 350°C. The catalyst with Cu/Zn = 1 and prepared at pH = 7 showed the smallest crystallite size (20 nm) and biggest surface area (SBET = 98m²/g). During the catalytic test relatively high conversion of CO into CO₂ at a temperature = 150°C was observed (96%) for the previous catalyst. Copyright © 2009 Inderscience Enterprises Ltd.

Author Keywords

Nanoparticles; Physicochemical; Texture; Water-gas shift reaction; Wgsr

Farid, E.T.^{a b}, Aal, N.A.^{b c}, Al-Ghamdi, A.A.^d, El-Mossalamy, E.H.^e, Al-Heniti, S.^f

New non-linear electrical-thermal switching of carbon nanoparticles/silane coupling agent reinforced phenolic resin nanocomposites

(2009) *International Journal of Nanoparticles*, 2 (1-6), pp. 89-99.

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Abstract

This paper evaluates the use of a new multifunctional conducting polymer containing phenolic resin reinforced by carbon black (CB) nanoparticles modified by silane coupling agent to produce positive temperature coefficient (PTC) thermistors and switching current. The percolation threshold of the conducting composites at room temperature was found to be as low as 4 wt% of CB. Temperature dependent electrical characterisation of phenolic resin/CB nanocomposites is performed. The composites exhibit PTC properties with ρ_{max}/ρ_{min} value as great as 104. Electrical parameters such as charge carriers type, drift mobility, concentration of charge carriers, activation and hopping energy are verified with CB content. The current-voltage curves of the nanocomposites change from linear to non-linear behaviour and the switching current is observed within the non-linear regime.

Author Keywords

Conducting polymer nanocomposites; Electrical properties; Interpenetrating networks

Bahajaj, A.A.^a, Asiri, A.M.^b, Alsoliemy, A.M.^b, Al-Sehemi, A.G.^c

Photochromic properties of 7',8'-dichloro-1,3,3-trimethylspiro[indoline-2, 3'-[3H]benzo[b][1,4]oxazine] doped in PMMA and epoxy resin thin films

(2009) *Pigment and Resin Technology*, 38 (6), pp. 353-358. Cited 1 time.

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Abstract

Purpose - The purpose of this paper is to evaluate the photochromic performance of photochromic compounds in polymer matrices. Design/methodology/ approach - The poly(methyl methacrylate) PMMA and epoxy resin doped with photochromic spirooxazine (SO) are prepared and the effects of ultraviolet (UV) irradiation are studied using spectrophotometer. The reversible reaction is effected using white light. Photochemical fatigue resistance of these films is also studied. Findings - Irradiation of colourless 7',8'-dichloro-1,3,3- trimethylspiro[indoline-2,3'-[3H]benzo[b][1,4]oxazine] (SO) doped in PMMA and epoxy resin with UV light (366 nm) results in the formation of an intense purple-red coloured zwitterionic photomerocyanine (PMC). The reverse reaction is photochemically induced by irradiation with white light. Photocolouration and photobleaching reactions follow a first-order rate equation. It is found that photocolouration rate constant of (SO) in both matrices is almost the same, which is unexpected. On the other hand, the rate of photobleaching reaction of (PMC) in PMMA is twice slower than that in the epoxy resin. It seems that the presence of the two chlorine atoms at positions 7' and 8' of the benzooxazine moiety destabilise the PMC in epoxy resin film and results in speeding up the fading process compared to that in PMMA. SO doped in epoxy resin shows much better fatigue resistance than that doped in PMMA. Research limitations/implications - The PMMA and epoxy resin polymers doped photochromic spirobenzooxazine described in this paper were prepared and studied. The principle of study established can be applied to any type of polymer or to any type of photochromic compounds. Practical implications - The photochromic materials developed can be used for different applications, such as coatings and holography. Originality/value - The method developed may be used to enhance the performance of photochromic materials. © 2009 Emerald Group Publishing Limited. All rights reserved.

Author Keywords

Films (states of matter); Photochemistry; Polymers; Spectroscopy; Spirooxazine

Al-Thabaiti, S.A., El-Mossalamy, E.H., Al-Nowaiser, F.M., Khan, Z.

Physico chemical studies for the formation of nanosize silver particles

(2009) *International Journal of Nanoparticles*, 2 (1-6), pp. 39-45.

Department of Chemistry, Faculty of Science, King Abdul Aziz University, P.O. Box 80203, Jeddah 21413, Saudi Arabia

Abstract

Transmission electron microscopic and kinetic data for the formation of surfactant stabilised growing microelectrode nanosize silver particles during the reduction of silver nitrate by ascorbic acid in the presence of ionic and non-ionic surfactants are reported for the first time. Upon mixing ascorbic acid to a solution of silver nitrate and cationic and/or anionic surfactants (cetyltrimethylammonium bromide and sodium dodecylsulphate), a readily distinguishable yellow colour appears, which is stable for several weeks. The plots of maximum wavelength absorbance versus time clearly indicate that the silver particles formation has an induction period followed by auto acceleration (sigmoid behaviour).

The extent of induction period depends on the experimental conditions. The reaction follows zero-order kinetics with respect to (ascorbic acid) for nanosize silver particles formation. ©2009 Inderscience Enterprises Ltd.

Author Keywords

Ascorbic acid; Nanoparticles; Oxidation; Reduction; Silver (I); Surfactants

Al-Ghamdi, A.A.^a, Al-Heniti, S.^a, El-Mossalamy, E.H.^b, Al-Assiri, M.^c, Al-Gharni, H.^c, Al-Hajry, A.^d, Aal, N.A.^{e f}, El-Tantawy, F.^{g h}

Preparation, characterisation and optical properties of zinc oxide nanoparticles obtained by new intercalation chemical route

(2009) *International Journal of Nanoparticles*, 2 (1-6), pp. 100-110.

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Abstract

A new simple intercalation chemical route was used to synthesise ZnO nanoparticles via ZnO, sodium doclecy sulfate as a surfactant and hydrogen peroxide at 90°C with strong stirring for five hours. The results of X-ray diffraction (XRD) and Fourier transformer infrared spectroscopy (FTIR) show that ZnO nanoparticles are all of crystalline hexagonal zincite phase. The results of scanning electron microscopy (SEM) and XRD indicate that the mean sizes of ZnO nanoparticles is about 25 nm. The thermal gravimetry reveals that the as-prepared ZnO has good thermal stability. Compared with other synthesis approaches, the proposed method can get fairly good product with a relatively low cost. The optical band gap energy of ZnO was 3.17 eV.

Author Keywords

Microstructure; Nanomaterials; Nanoparticles; Zinc oxide; Zno

Tripathi, K.^a, Husain, M.^a, Salah, N.A.^b, Habib, S.S.^b, El-Hamidy, S.M.A.^c, Zahed, N.Z.^c, Khan, Z.H.^b

Studies on ZnO nanorods

(2009) *International Journal of Nanoparticles*, 2 (1-6), pp. 148-155.

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^c Faculty of Science, Department of Biological Sciences, King Abdulaziz University, P.O. Box 80203, Jeddah-21589, Saudi Arabia

Abstract

Nanorods of ZnO are synthesised using thermal evaporation method. In this method, Zn powder is evaporated at a temperature of 400°C in the presence of oxygen and argon gases. The crystallinity of these ZnO nanorods is studied using XRD. The XRD pattern suggests that these as-grown nanorods are crystalline and diffraction pattern are indexed to a typical wurtzite structure. This agrees well with the reported data (JCPDS card no. 36-1451). It is clear from the transmission electron microscope (TEM) images that the diameter of these nanorods varies from 20 nm to 70 nm and their length is of the order of several hundred nanometers. The UV-Vis spectra show a broad peak at 379 nm, which is a characteristic of ZnO. Copyright ©: 2009 Inderscience Enterprises Ltd.

Author Keywords

Scanning electron microscope; SEM; TEM; Transmission electron microscope; UV-Vis spectra; X-ray diffraction; XRD; ZnO nanorods

Habib, S.S.^a, Salah, N.^a, Khan, Z.H.^a, Al-Heniti, S.^b, Al-Hazmi, F.S.^b, Khan, S.A.^b, Faidah, A.S.^b, Al-Khair, O.A.^b

Synthesis and characterisation of tin dioxide nanoparticles and effect of annealing temperature

(2009) *International Journal of Nanoparticles*, 2 (1-6), pp. 263-269. Cited 1 time.

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Abstract

Nanopowder of SnO₂ was successfully synthesised by the chemical co-precipitation technique. The product sample was characterised by transmission electron microscope (TEM), X-ray diffraction (XRD) and UV-visible absorption spectrum. Analysis shows that the nanomaterial is found to be phase-pure and nanocrystalline, with a mean particle size around 50 nm. The maximum absorption is observed at around 320 nm. Effect of different annealing temperature on the particle size and shape are also studied. There is no change in the shape and size of these nanoparticles, while annealing them at temperatures ranging from 300°C-600°C. This suggests that the prepared nanoparticles might be useful as gas sensors at hot environments. © 2009 Inderscience Enterprises Ltd.

Author Keywords

Nanoparticles; Sensors; SnO₂; TEM; Transmission electron microscope; UV-visible; X-ray diffraction; XRD

Yaghmour, S.J.

Influence of γ -irradiation on optical properties of manganese phthalocyanine thin films

(2009) *Journal of Alloys and Compounds*, 486 (1-2), pp. 284-287.

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Abstract

The optical absorption of thermally evaporated MnPc thin film has been studied in the UV-vis region. The absorption spectra for the as-deposited and irradiated films showed two well-defined absorption bands of phthalocyanine molecule, namely the Q-band and Soret band (B). The optical properties of thermally evaporated manganese phthalocyanine thin films were characterized using spectrophotometric measurements of transmittance and reflectance at normal incidence of light in the wavelengths range 200-2500 nm. The refractive index (n) and the absorption index (k) were calculated. The effects of γ -irradiation on the optical properties were investigated for dosimetry applications. The values of the optical band gap E_{opt} , the transport gap and the dispersion parameters for as-deposited and irradiated films with different doses of γ -irradiation were also estimated and discussed. © 2009.

Author Keywords

γ -Irradiation; MnPc thin film; Optical absorption

Al-Ghamdi, A.A.^a, Mahmoud, W.E.^{a b}, Yaghmour, S.J.^a, Al-Marzouki, F.M.^a

Structure and optical properties of nanocrystalline NiO thin film synthesized by sol-gel spin-coating method

(2009) *Journal of Alloys and Compounds*, 486 (1-2), pp. 9-13. Cited 2 times.

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Abstract

NiO thin film was prepared by sol-gel spin-coating method. This thin film annealed at $T = 600$ °C. The structure of NiO thin film was investigated by means of X-ray diffraction (XRD) technique and scanning electron microscopy (SEM). The optical properties of the deposited film were characterized from the analysis of the experimentally recorded transmittance and reflectance data in the spectral wavelength range of 300-800 nm. The values of some important parameters of the studied films are determined, such as refractive index (n), extinction coefficient (k), optical absorption coefficient (α) and band energy gap (E_g). According to the analysis of dispersion curves, it has been found that the dispersion data obeyed the single oscillator of the Wemple-DiDomenico model, from which the dispersion parameters and high-frequency dielectric constant were determined. In such work, from the transmission spectra, the dielectric constant (ϵ_∞), the third-order optical nonlinear susceptibility $\chi^{(3)}$, volume energy loss function (VELF) and surface energy loss function (SELF) were determined. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

NiO; Optical properties; Sol-gel; Spin coating; Structure

Gazzaz, H.A.^{a b}, Ember, E.^a, Zahl, A.^a, Van Eldik, R.^a

Mechanistic information from volume profiles for water exchange and complex-formation reactions of aquated Ni(II). pH, buffer and medium effects

(2009) *Dalton Transactions*, (43), pp. 9486-9495.

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Abstract

Rate and activation parameters for the complex-formation reaction of Ni²⁺ with 4-(2-pyridylazo)-N,N-dimethyl aniline (PADA) were studied as a function of pH in different buffers in both aqueous and sodium dodecyl sulfate (SDS) micelle solutions. In aqueous Tris buffer solution, the forward and backward rate constants increased with increasing pH, while the complex-formation constant decreased due to a larger increase in the backward rate constant. The activation entropy, ΔS^\ddagger , and activation volume, ΔV^\ddagger , changed with increasing pH from positive to negative values, suggesting an apparent changeover from a dissociative to a more associative mechanism. Complex-formation reactions with 2,2'-bipyridine in Tris buffer showed almost no increase in the forward and backward rate constants on increasing the pH, but the ΔS^\ddagger and ΔV^\ddagger values became more negative. N-ethylmorpholine buffer showed no pH effect on the rate constants and activation parameters. Water exchange reactions of aquated Ni²⁺ were also studied as a function of pH under the same conditions. The reported rate and activation parameters for water exchange in Tris and N-ethylmorpholine buffers are consistent with those found for the complex-formation reactions of Ni²⁺ with PADA. The observed pH and buffer effects for both the complex-formation and water exchange reactions of aquated Ni²⁺ can be accounted for in terms of the formation of a Ni²⁺-Tris complex in Tris buffer and general base catalysis by the buffer components. In SDS micelle solution, the complex-formation reaction with PADA was much faster than in aqueous solution, but the increase in rate constant with increasing pH was less significant, while ΔS^\ddagger and ΔV^\ddagger became more positive, pointing to a more dissociative mechanism. For SDS micelle solutions there was no effect on the water exchange rate constant or activation volume. Mechanistic interpretations are offered for all observed pH, buffer and medium effects. © The Royal Society of Chemistry 2009.

Bahishti, A.A.^a, Majeed Khan, M.A.^a, Patel, B.S.^a, Al-Hazmi, F.S.^b, Zulfequar, M.^a

Effect of laser irradiation on thermal and optical properties of selenium-tellurium alloy (2009) *Journal of Non-Crystalline Solids*, 355 (45-47), pp. 2314-2317.

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^b Physics Department, Faculty of Science, King Abdul Aziz University, Jeddah, Saudi Arabia

Abstract

The crystallization parameters such as glass transition temperature (T_g), onset crystallization temperature (T_c), peak crystallization temperature (T_p) and enthalpy released (ΔH_C) of the bulk Se-Te chalcogenide glass has been studied by using Differential Scanning Calorimeter (DSC), under non-isothermal condition at a heating rate of 20 K/min. The values of T_g , T_c , T_p and ΔH_C with and without laser irradiation for different exposure time have been studied. The optical absorption of pristine and laser irradiated thermally evaporated Se-Te films has been measured. The films shows indirect allowed interband transition that is influenced by the laser irradiation. The optical energy gap has been found to decrease from 1.61 to 1.38 eV with increasing irradiation time from 5 to 20 min. The results have been analyzed on the basis of laser irradiation-induced defects in the film. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Absorption; Alloys; Calorimetry; Chalcogenides; Crystallization; Glass transition; Laser-matter interactions; Lasers; Optical spectroscopy; Radiation; Radiation effects; Vapor phase deposition

Atallah, M.A.

Erratum to: "Probability distributions conditioned by the available information: Gamma Distribution and Moments" [Comput. Math. Appl. 52 (2006) 289-304] (DOI:10.1016/j.camwa.2006.08.020) (2009) *Computers and Mathematics with Applications*, 58 (9), pp. 1878-1886.

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Khan, S.A.^a, Asiri, A.M.^a, Yusuf, M.^b

Erratum to "Synthesis and biological evaluation of some thiazolidinone derivatives of steroid as antibacterial agents" [Eur. J. Med. Chem. 44 (2009) 2597-2600] (DOI:10.1016/j.ejmech.2008.09.004) (2009) *European Journal of Medicinal Chemistry*, 44 (11), p. 4784.

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Ahmad, B., Alsaedi, A.

Existence of solutions for anti-periodic boundary value problems of nonlinear impulsive functional integro-differential equations of mixed type

(2009) *Nonlinear Analysis: Hybrid Systems*, 3 (4), pp. 501-509.

Department of Mathematics, Faculty of Science, King Abdulaziz University, P.O. Box. 80203, Jeddah, 21589, Saudi Arabia

Abstract

We discuss the existence of minimal and maximal solutions for a class of first order nonlinear impulsive functional integro-differential equations of mixed type with anti-periodic boundary conditions. The main tool of study is the monotone iterative technique. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

Impulsive functional integro-differential equations; Minimal and maximal solutions; Monotone iterative technique; Upper and lower solutions

Ahmad, B.^a, Nieto, J.J.^b

Existence results for a coupled system of nonlinear fractional differential equations with three-point boundary conditions

(2009) *Computers and Mathematics with Applications*, 58 (9), pp. 1838-1843. Cited 3 times.

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Abstract

This paper studies a coupled system of nonlinear fractional differential equations with three-point boundary conditions. Applying the Schauder fixed point theorem, an existence result is proved for the following system $D^{\alpha} u(t) = f(t, v(t), D^{\beta} v(t))$, $D^{\beta} v(t) = g(t, u(t), D^{\gamma} u(t))$, $t \in (0, 1)$, $u(0) = 0$, $u(1) = \gamma u(\eta)$, $v(0) = 0$, $v(1) = \gamma v(\eta)$, where $\alpha, \beta, \gamma, \eta, \gamma$ satisfy certain conditions. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

Coupled system; Existence; Fractional differential equations; Schauder fixed point theorem

Salah, N.^a, Habib, S.S.^a, Khan, Z.H.^a, Al-Hamed, S.^b, Djouider, F.^c

Functionalization of gold and carbon nanostructured materials using gamma-ray irradiation

(2009) *Radiation Physics and Chemistry*, 78 (11), pp. 910-913.

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Abstract

Gold nanoparticles were successfully attached to the surface sites of carbon nanotubes (CNT). Both nanostructured materials were functionalized by λ -ray irradiation without chemical treatments for creating active sites. UV-visible absorption spectra of the un-irradiated and gamma ray-irradiated nanomaterials are also studied. The absorption spectrum of the irradiated CNT shows a new strong peak located at 700 nm, which might act as the active site on the surface of CNT, the result being an attachment of gold nanoparticles. This approach provides an efficient method to attach other nanostructures to carbon nanotubes for using them in different applications such as medicine and synthesis of catalytic materials. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

Carbon nanotubes; Functionalization; Gamma rays; Gold Nanoparticles

Asiri, A.M.A.^a, Baghaffar, G.A.^a, Badahdah, K.O.^a, Al-Sehemi, A.G.M.^b, Khan, S.A.^a, Bukhari, A.A.^a

Multifunctional switches based on bis-imidazole derivative

(2009) *Journal of Chemical Sciences*, 121 (6), pp. 983-987.

^a Chemistry Department, Faculty of Science, King Abdul Aziz University, P.O. Box 80203, Jeddah 21413, Saudi Arabia

^b Department of Chemistry, Teacher's College, King Khalid University, P.O. Box 249, Abha, Saudi Arabia

Abstract

A multifunctional bis-imidazole derived from piperonal was prepared and found to have photo, thermo, solvato and piezochromism with colour changes from pale green to deep blue. The multifunctionality colour changes and stability of the coloured species make the derivative candidates for various applications such as optical data storage. The photochromic properties and performance were found to be affected remarkably upon changing the solvent. © Indian Academy of Sciences.

Author Keywords

Free radical equilibrium; Imidazole; Photochromism; Piezochromism; Solvatochromism; Thermochromism

Zenkour, A.M.

The refined sinusoidal theory for FGM plates on elastic foundations

(2009) *International Journal of Mechanical Sciences*, 51 (11-12), pp. 869-880.

Department of Mathematics, Faculty of Science, King AbdulAziz University, P.O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

Using the refined sinusoidal shear deformation plate theory and including plate-foundation interaction, a thermoelastic bending analysis is presented for a simply supported, rectangular, functionally graded material plate subjected to a transverse uniform load and a temperature field, and resting on a two-parameter (Pasternak model) elastic foundation. The present shear deformation theory is simplified by enforcing traction-free boundary conditions at the plate faces. No transversal shear correction factors are needed because a correct representation of the transversal shearing strain is given. Material properties of the plate are assumed to be graded in the thickness direction according to a simple power-law distribution in terms of the volume fractions of the constituents. The equilibrium equations of the present plate are given based on various plate theories. A number of examples are solved to illustrate the numerical results concerning bending response of homogeneous and functionally graded rectangular plates resting on two-parameter elastic foundations from which results for Winkler elastic foundations are obtained as a limiting case. The influences played by transversal shear deformation, plate aspect ratio, side-to-thickness ratio, volume fraction distributions, and elastic foundation parameters are studied. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

Functionally graded material; Thermal field Elastic foundations; Uniform load; Various plate theory

Shettigar, S.^a, Umesh, G.^b, Poornesh, P.^c, Manjunatha, K.B.^b, Asiri, A.M.^d

The third-order nonlinear optical properties of novel styryl dyes

(2009) *Dyes and Pigments*, 83 (2), pp. 207-210.

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Abstract

The third-order nonlinear optical properties of two novel styryl dyes, namely, 1,3-diethyl-5-(4-methoxybenzylidene)-2-thioxodihydropyrimidine-4,6(1H,5H)-dione and 5-(3,4-dimethoxybenzylidene)-1,3-diethyl-2-thioxodihydropyrimidine-4,6(1H,5H)-dione were studied using the Z-scan technique employing 7 ns laser pulses at 532 nm. The nonlinear refractive index, nonlinear absorption coefficient, magnitude of effective third-order susceptibility and coupling factor were determined. The optical power limiting behavior of the colorants was ascribed to two-photon absorption phenomenon. Nonlinear absorption cross-section increased with increase in n electron density and the effective two-photon absorption cross-section was two orders of magnitude larger than those of commercially available azo compounds. The results suggest that these colorants offer promise as nonlinear optical materials for device applications. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

Coupling factor; Nonlinear absorption; Nonlinear refraction; Optical power limiting; Styryl dyes; Z-scan

Wood, A.S.^a, Mosally, F.^b, Al-Fhaid, A.^b

On high-order polynomial heat-balance integral implementations

(2009) *Thermal Science*, 13 (2), pp. 11-25.

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Abstract

This article reconsiders aspects of the analysis conventionally used to establish accuracy, performance and limitations of the heat balance integral method: theoretical and practical rates of convergence are confirmed for a familiar piecewise heat-balance integral based upon mesh refinement, and the use of boundary conditions is discussed with respect to fixed and moving boundaries. Alternates to mesh refinement are increased order of approximation or non-polynomial approximants. Here a physically intuitive high-order polynomial heat balance integral formulation is described that exhibits high accuracy, rapid convergence, and desirable qualitative solution properties. The simple approach combines a global approximant of prescribed degree with spatial sub-division of the solution domain. As a variational-type method, it can be argued that heat-balance integral is simply "one amongst many". The approach is compared with several established variational formulations and performance is additionally assessed in terms of "smoothness".

Author Keywords

Heat balance integral; High-order polynomial approximants

Mahmoud, W.E.^{a, b}, Al-Ghamdi, A.A.^a, El-Tantawy, F.^b, Al-Heniti, S.^a

Synthesis, characterization and charge transport mechanism of CdZnO nanorods
(2009) *Journal of Alloys and Compounds*, 485 (1-2), pp. 59-63. Cited 1 time.

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^b Suez Canal University, Faculty of Science, Physics Department, Ismailia, Egypt

Abstract

ZnO and Cd-doped ZnO nanostructures were prepared by new facile method at 80 °C. XRD measurement indicated that both samples had typical hexagonal wurtzite structures. Transmission electron microscopy (TEM) measurement shows that rod-like crystals have been formed. EDX measurement confirms the incorporation of the cadmium ion into the crystalline lattice of ZnO and indicated that cadmium ions uniformly distributed on the surface of the rods. The doping with cadmium ions has a great influence on the optical properties of the ZnO. The electrical measurements of Cd-doped ZnO nanorod were measured. The current-voltage (I-V) characteristic curve revealed that the charge transport above 4 V is mainly non-linear due to grain boundary contribution. The complex impedance spectroscopy was confirmed that the grain boundary effect controls the charge transport mechanism through CdZnO ceramic material. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Charge transport mechanism; Nanorod; Optical; Structure

El-Nahass, M.M.^a, Atta, A.A.^a, El-Shazly, E.A.A.^a, Faidah, A.S.^b, Hendi, A.A.^c

Influence of γ -irradiation on the optical properties of nanocrystalline tin phthalocyanine thin films
(2009) *Materials Chemistry and Physics*, 117 (2-3), pp. 390-394.

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Abstract

SnPc in powder and thin film forms were found to be polycrystalline with monoclinic lattice. The morphological and structural properties of the obtained SnPc films were characterized from electron scanning micrographs and X-ray diffraction patterns. In the γ -irradiated film the formed agglomeration increased the crystallite size. The refractive index, n , and the absorption index, k , were obtained from spectrophotometric measurements of the transmittance and reflectance at normal incidence of light in the wavelength range 200-2500 nm. γ -Irradiation films shifted the transmission edge toward lower wavelength and increase the optical energy gap value. According to the analysis of dispersion curves, the dielectric constants and dispersion parameters were obtained. The absorption analysis performed indicated indirect allowed electronic transitions and the optical energy band gap 2.84 and 2.63 eV for the as-deposited and the γ -irradiated films, respectively. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Effects of γ -irradiation; Optical properties; SnPc thin films

Khan, Z., Al-Thabaiti, S.A., El-Mossalamy, E.H., Obaid, A.Y.

Studies on the kinetics of growth of silver nanoparticles in different surfactant solutions
(2009) *Colloids and Surfaces B: Biointerfaces*, 73 (2), pp. 284-288. Cited 1 time.

Department of Chemistry, Faculty of Science, King Abdul Aziz University, P.O. Box 80203, Jeddah, 21413, Saudi Arabia

Abstract

Silver nanoparticles were prepared in aqueous silver nitrate solution using hydrazine as reducing agents in presence of

two ionic surfactants (cetyltrimethylammonium bromide; CTAB and sodium dodecyl sulfate; SDS) and one non-ionic surfactant (Triton X-100). The reaction rate was determined spectrophotometrically. The nature of the head group of these surfactants is responsible for the formation of stable, yellow and transparent silver sol. For a certain reaction time, i.e., 20 min, the absorbance of reaction mixture first increased until it reached a maximum, then decreased with [hydrazine]. The reaction follows first-order kinetics with respect to each in [hydrazine] and [Ag⁺]. The results suggest formation of a complex between silver(I) and hydrazine, decomposes in a rate-determining step, leading in the formation of a free radical, which again reacts with the silver(I) in a subsequent fast step to yield the products. The transmission electron microscopic (TEM) images show that CTAB stabilized silver nanoparticles are spherical and of uniform particle size, and the average particle size is about 15 nm. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

CTAB; Growth of nanoparticles; Hydrazine; Kinetics; Silver(I)

Asiri, A.M.^a, Akkurt, M.^b, Khan, I.U.^c, Arshad, M.N.^c, Khan, S.A.^a

(2Z)-2-(4-Methyl-phen-yl)-3-(2-naphth-yl)prop-2-enitrile

(2009) *Acta Crystallographica Section E: Structure Reports Online*, 65 (10), pp. o2409.

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^c Department of Chemistry, Government College University, Lahore, Pakistan

Abstract

In the title compound, C₂₀H₁₅N, the dihedral angle between the naphthalene and benzene rings is 60.30 (16)°. The crystal packing features very weak inter-molecular C-H...N inter-actions.

Abdel Salam, M.^a, Burk, R.C.^b

Thermodynamics and Kinetics Studies of Pentachlorophenol Adsorption from Aqueous Solutions by Multi-Walled Carbon Nanotubes

(2009) *Water, Air, and Soil Pollution*, pp. 1-11. Article in Press.

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Abstract

The adsorption of pentachlorophenol (PCP) from aqueous solutions using pristine multi-walled carbon nanotubes (MWCNTs) was studied kinetically and thermodynamically. The results showed that MWCNTs are good adsorbents for the elimination of PCP from aqueous solutions in a very short time compared with activated charcoal. The kinetics study showed that the adsorption of PCP is mainly due to the diffusion of PCP from the aqueous phase to the solid phase beside intra-particle diffusion. This intra-particle diffusion was more significant for activated charcoal compared with MWCNTs. The equilibrium adsorption of PCP at different temperatures was studied, and the adsorption isotherms were well described using different adsorption models. Thermodynamics study showed that the adsorption process was product-favored (enhanced) as the temperature decreased. © 2009 Springer Science+Business Media B.V.

Author Keywords

Kinetics; Multi-walled carbon nanotubes; Pentachlorophenol adsorption; Thermodynamics; Water treatment

in Press

Gabal, M.A.

Effect of Mg substitution on the magnetic properties of NiCuZn ferrite nanoparticles prepared through a novel method using egg white

(2009) *Journal of Magnetism and Magnetic Materials*, 321 (19), pp. 3144-3148. Cited 3 times.

Chemistry Department, Faculty of Science, King Abdul Aziz University, Jeddah, Saudi Arabia

Abstract

Nanocrystalline Mg-substituted NiCuZn ferrites were successfully synthesized, for the first time, by using metal nitrates and freshly extracted egg white. The thermal decomposition process of the nitrate-egg white precursors was investigated by thermogravimetric (TG) technique. X-ray diffraction (XRD) revealed that, single-phase cubic ferrites with average particle size of 23.9-35.1 nm were directly formed after ignition at 500 °C. No noticeable variation of lattice parameters with increasing magnesium content was observed, while X-ray densities were found to decrease. This can be explained on the basis of ionic radii and atomic masses of the substituted cation. Transmission electron microscope (TEM) shows that, particles are permanently magnetized and get agglomerated. The saturation

magnetization (Ms) and coercivity (Hc) as a function of Mg content were investigated using vibrating sample magnetometer (VSM). It has been found that the Ms increases firstly up to $x=0.2$ and then decreases, while Hc continuously decreases. Magnetic susceptibility measurements give results which agree well with those obtained by VSM. The obvious decrease in the Curie temperature (TC) with increasing Mg indicates that the ferrimagnetic grains are widely separated and enclosed by non-magnetic magnesium ions. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Egg white; Mg substitution; NiCuZn ferrite; Susceptibility; VSM; XRD

Badran, R.I.^{a, b}, Brüggemann, R.^c, Carius, R.^d

Minority-carrier properties of microcrystalline germanium

(2009) *Journal of Optoelectronics and Advanced Materials*, 11 (10), pp. 1464-1466.

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Abstract

The ambipolar diffusion length and the minority-carrier mobility-lifetime products of microcrystalline hydrogenated germanium thin films, prepared by plasma enhanced chemical vapour deposition, are investigated by using the steady-state photocarrier technique. Different thin film samples were deposited with the dilution of the process gases, germane in hydrogen, $GC = [GeH_4]/[H_2]$, between 0.2% to 1%. The minority-carrier mobility-lifetime products are almost temperature independent. These results are consistent with a temperature-independent occupation of the negatively charged recombination centres that is determined by the Fermi level. The longest diffusion length was determined for $GC = 0.2\%$, in agreement with earlier complementary results on sensors.

Author Keywords

Diffusion length; Electrical properties; Microcrystalline germanium

El-Mossalamy, E.H.^a, Arafa, H.M.^b

New congeners of molecular phthalocyanine with benzoquinones derivatives

(2009) *Oriental Journal of Chemistry*, 25 (4), pp. 817-823.

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Abstract

The charge transfer complexes between phthalocyanine as a donor and benzoquinone derivatives as acceptors viz., 2,3-dichloro-5,6-dicyano-1,4-benzoquinone (DDQ), p-chloranil (CHL) and chloranilic acid (CHLA) were synthesized and investigated by using some modern techniques such as; ICP and Nujol mull technique using spectrophotometer, that after identification and using synthesis and spectral methods, like elemental analysis, IR and ¹H NMR and melting point. Absorption fine structure spectroscopy with the high spatial resolution of X-ray microscopy. Linear Dichroism (LD), the anisotropic absorption of linearly polarised radiation by an oriented molecule, was observed in CT spectra. LD-NEXAFS offers excellent sensitivity to molecular orientation, and can be used to characterise molecular order in materials at high spatial resolution. Also the imaging surface of complexes was confirmed using optical microscope, electron microscope (scanning SEM, transmissionTEM). Metal ions under study (Pt, Fe and Hf) were measured in milligrams per liter. Absorption spectrum was measured using suspension method using paraffin oil to study the electronic transitions for CT complexes. Analyses indicate the particle sizes of CT complex in the range of 65-85 nm.

Author Keywords

ICP; Charge transfer; Nanophthalocyanine; SEM; TEM using benzoquinone

Kutbi, M.A.

Nonconvex sets and nonlinear noncommuting operators

(2009) *International Journal of Mathematical Analysis*, 3 (13-16), pp. 731-738.

Department of Mathematics, King Abdul Aziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

We prove a common fixed point result for nonlinear noncommuting I-nonexpansive map T defined on a non-starshaped domain in the setup of p-normed spaces. As applications, we establish Brosowski-Meinardus type

approximation theorems. Our results unify and extend the results of Al-Thagafi, Dotson, Habiniak, Jungck and Sessa, Sahab, Khan and Sessa, Singh and Hussain and Khan.

Author Keywords

Banach operator pair; Common fixed point; Contractive family; Invariant approximation

El-Tantawy, F.^{a, b}, Al-Ghamdi, A.A.^c, Al-Heniti, S.^c, Abdel Aal, N.^d

A novel conducting nanocomposites containing phenolic resin-carbon nanoparticles for electromagnetic wave shielding effectiveness at microwave frequency

(2009) *International Journal of Nanomanufacturing*, 4 (1-4), pp. 51-59.

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Abstract

The microstructure of phenolic resin reinforced carbon black (CB) nanoparticles was examined by scanning electron microscopy. The thermal stability of the nanocomposites was examined by means of isothermal resistivity change at 100°C. Electromagnetic interference (EMI) response of conducting phenolic-CB nanocomposites in the frequency range from 1 GHz to 12 GHz has been studied. In the microwave range from 8 to 12 GHz conducting nanocomposites shows a shielding effectiveness in the range 30-40 dB. The highest EMI of nanocomposites was 55 dB for CB12 sample which is realistic for an industrial application. The results of this study demonstrate the high possibility of using the proposed nanocomposites as electronic conductive fillers in polymer package and EMI shielding effectiveness at microwave frequency. Copyright © 2009, Inderscience Publishers.

Author Keywords

Conducting polymer nanocomposites; Electromagnetic shielding; Network structure

Farraj, R.M., Ansari, A.A., Al-Hazmi, F.S.

AC response of AlN/GaN double-barrier resonant tunnelling diodes

(2009) *International Journal of Nanomanufacturing*, 4 (1-4), pp. 69-76.

Department of Physics, Faculty of Science, King Abdulaziz University, PO Box 80203, Jeddah 21589, Saudi Arabia

Abstract

Capacitance-voltage (C-V) measurements of GaN/AlN double barrier resonant tunnelling diodes have been made at 77K and 300K. Capacitance-frequency measurements were also made over frequency range of 50Hz-1MHz with a view to study the behaviour of traps located in the quantum well. The role of 2DEG has also been taken into account to explain the observed C-V response. The behaviour of the 2DEG as a function of bias voltages has been simulated by using a computer program and it predicts correctly the vanishing of capacitance at higher biases. Copyright © 2009, Inderscience Publishers.

Author Keywords

Capacitance-voltage characteristics; Double-barrier diode; GaN/AlN heterostructure; Nanoelectronic devices; Nanomanufacturing; Resonant tunnelling

Lal, J.K.^a, Khan, S.A.^{a, b}, Al-Ghamdi, A.A.^b, Khan, Z.H.^c

Characterisation of amorphous Se₉₇Te₃ nanoparticles prepared by ball milling

(2009) *International Journal of Nanomanufacturing*, 4 (1-4), pp. 208-218.

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Abstract

The authors' present research work is concentrated with structural and optical studies of amorphous Se₉₇Te₃ nanoparticles. The amorphous Se₉₇Te₃ material was used as a starting material. The ball milling was performed in a Laboratory 8000M-Mixer/Mill (SPEX) mill. The milled materials were characterised by XRD, transmission electron microscopy (TEM) and optical measurements within the wavelength region 300 nm-1000 nm. From XRD measurements, it is found that an amorphous stage is also achieved during the milling process. TEM measurements showed that after 30 hours, 40 hours and 70 hours of milling time, amorphous nanoparticles of different sizes were developed. The optical band gap and optical constants of the milled materials have been studied as a function of

photon energy. Optical absorption measurements indicate that the absorption mechanism is due to indirect transition. It has been observed that the absorption coefficient increases linearly with the increase in photon energy and the optical band gap increases with the increase of milling time. Copyright © 2009, Inderscience Publishers.

Author Keywords

Ball milling; Nanoparticles; Optical constants

Hermas, A.-E.A., Salam, M.A., Al-Juaid, S.S., Al-Thabaiti, S.A.

Electrochemical coating of stainless steel with multi-walled carbon nanotubes/polyaniline composite layer (2009) *International Journal of Nanomanufacturing*, 4 (1-4), pp. 166-174.

Chemistry Department, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract

Doped polyaniline (PANI) in its emeraldine salt form with different quantities of oxidised multi-walled carbon nanotubes (OxMWCNTs) via in situ electro-polymerisation on the stainless steel (SS) has been performed. Presence of OxMWNTs in the composite was confirmed by thermal gravimetric analysis (TGA) and scanning electron microscope (SEM). The OxMWNTs increased significantly the electro-deposition rate on the steel surface. The reinforcing of OxMWNTs in the PANI decreased the porosity of the PANI and forming a network held the polymer. The influences of composite layer on the passivation and corrosion of the SS were studied and compared with pure PANI layer. Copyright © 2009, Inderscience Publishers.

Author Keywords

Carbon nanotubes; CNTs; Coating; Composite; Corrosion; Electrodeposition; Polyaniline; Protection

Al-Hazmi, F.S., Farraj, R.M., Ansari, A.A.

I-V-T studies on GaN-AlN double barrier resonant tunnelling diodes (2009) *International Journal of Nanomanufacturing*, 4 (1-4), pp. 60-68.

Department of Physics, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

Double barrier resonant tunnelling diodes are the first practical nanoelectronic devices which are being actively pursued for applications in electronic circuits. Temperature dependent current-voltage behaviour of GaN/AlN double barrier resonant tunnelling diodes has been studied between 77K and 420K. The absence of resonant tunnelling peak(s) in these nanoelectronic devices has been explained on the presence of traps/ defects in the quantum well which tend to destroy coherent tunnelling. Thermal activation energy of the traps has been estimated. A model has been proposed which accounts for the observed I-V-T behaviour. Copyright © 2009, Inderscience Publishers.

Author Keywords

Current-voltage characteristics; DBRTDs; Double barrier resonant tunnelling diodes; Double-barrier diode; GaN/AlN heterostructure; Nanoelectronic devices; Nanotechnology; Resonant tunnelling

Babkair, S.S., Ansari, A.A.

Nanoparticles based solar cells and their application in Saudi Arabia (2009) *International Journal of Nanomanufacturing*, 4 (1-4), pp. 117-123.

Department of Physics, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

Recent developments in nanotechnology have created exciting possibilities for more efficient conversion of solar radiation into electricity. The new devices based on nano-sized particles are expected not only to have higher conversion efficiencies compared to more conventional solar cells, but are also likely to bring down the costs which will make them competitive with electricity generated from fossil fuels. This presentation introduces some of these devices and issues related to their development. Potential areas of applications in Saudi Arabia are outlined. Saudi Arabia with a year round sunny climate is ideally suited for large scale exploitation of this abundant natural resource. Copyright © 2009, Inderscience Publishers.

Author Keywords

Application solar energy; DSSCs; Dye-sensitised-solar-cells; Nanotechnology; Recycling carbon dioxide; Saudi Arabia

Basahel, S.N., El-Mossalamy, E., Mokhtar, M.

Preparation and physicochemical characterisation of thermally stable nano-sized hopcalite catalysts
(2009) *International Journal of Nanomanufacturing*, 4 (1-4), pp. 159-165. Cited 1 time.

Department of Chemistry, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

Hopcalite catalyst precursors were prepared by coprecipitation under constant pH and temperature. The thermal behaviour of catalyst precursor was investigated using TG and DTA. The crystal structure and solid-solid interactions were studied using powder X-ray diffraction (PXRD). The particle sizes of the prepared solids were computed using Scherer equation. The surface area of the prepared catalysts using adsorption of nitrogen at 77K and the catalytic activity towards CO oxidation by O₂ were investigated. The computed values for the crystallite size of Cu_{1.5}Mn_{1.5}O₄ phase ranged between 52 nm and 80 nm for all solid samples. The produced Cu_{1.5}Mn_{1.5}O₄ phase remained as a nanocrystalline solid even by heating at 950°C. The kinetics of thermal decomposition of catalyst precursors suggest a mechanism for the solid-solid interaction between these oxides and clarify the formation of nanosized hopcalite spinel. The activation energy data derived from thermal kinetics revealed that the best chemical composition of the hopcalite system which shows a large surface area and higher catalytic activity is that with Cu/Mn = 3. Copyright © 2009, Inderscience Publishers.

Author Keywords

Adsorption of N₂; CO oxidation; Cu_{1.5}Mn_{1.5}O₄; Hopcalite; Nano-sized; Thermal behaviour; X-ray diffraction; XRD

Al-Ghamdi, A.A.^a, Faidah, A.S.^a, Yaghmour, S.J.^a, Al-Heniti, S.^a, Al-Hazmi, F.S.^a, Khan, S.A.^{a, b}

Synthesis and characterisation of amorphous SeTe nanorods prepared by ball milling
(2009) *International Journal of Nanomanufacturing*, 4 (1-4), pp. 197-207.

^a Department of Physics, Faculty of Science, King Abdul Aziz University, Jeddah-21589, Saudi Arabia

^b Department of Physics, St. Andrew's P.G. College, Gorakhpur-273001 UP, India

Abstract

The amorphous Se₉₇Te₃ nanorods were prepared by mechanical milling. The amorphous Se₉₇Te₃ materials were used as a starting material. The milled materials were characterisation by XRD, TEM and optical measurement by JASCO, UV/VIS/ NIR spectrophotometer in a wavelength region 300 nm-1000 nm. The experimental result shows that an amorphous stage is also achieved during the milling process. TEM analysis showed that after 50 hours of milling time, multi-walled amorphous nanorods were formed with a diameter of about 90 nm and after 60 hours of milling time amorphous nanowires of about 80 nm diameter was formed. The optical absorption measurement indicates that the absorption mechanism is due to indirect transition. It has been observed that the absorption coefficient increases lineally with the increase in photon energy and the optical band gap increases with the increase of milling time. Copyright © 2009, Inderscience Publishers.

Author Keywords

Amorphous materials; Amorphous nanoparticles; Ball milling; Nanorods; Optical band gap mechanical alloying; X-ray diffraction; XRD

Mahmoud, W.E.

A novel photodiode made of hybrid organic/inorganic nanocomposite
(2009) *Journal of Physics D: Applied Physics*, 42 (15), art. no. 155502, .

Faculty of Science, Physics Department, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract

Novel hybrid organic/inorganic nanocomposites made of metal oxide and conjugated polymer nanocomposite and its application in bulk-heterojunction solar cells were studied. The composite was composed of different concentrations of strontium titanate (SrTiO₃) and polyaniline doped phosphoric acid. The optimum concentration of strontium titanate was found to be 0.2 v/v. An inorganic-organic photovoltaic device with a structure of Ag/Pani-H₃PO₄-SrTiO₃/Al has been fabricated. The ideality factor value of the diode was found to be 1.8. This n value of the diode implies a deviation from ideal junction behaviour. The barrier height ϕ_b value for the diode was found to be 0.56 eV. The Ag/Pani-H₃PO₄-SrTiO₃/Al diode shows a photovoltaic behaviour with a maximum open-circuit voltage V_{oc} of 2.49 V, and short-circuit current I_{sc} of 5.6 mA under light illumination $\lambda = 460$ nm. The conversion efficiency was found to be 5.2%. It is evaluated that the Ag/Pani-H₃PO₄-SrTiO₃/Al diode is a good photodiode with calculated electronic parameters. © 2009 IOP Publishing Ltd.

Al-Heniti, S.H.

Kinetic study of non-isothermal crystallization in Fe₇₈Si₉B₁₃ metallic glass
(2009) *Journal of Alloys and Compounds*, 484 (1-2), pp. 177-184.

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Abstract

This paper reports the differential scanning calorimetric (DSC) studies of metallic glass ribbon Fe₇₈Si₉B₁₃ at different heating rates. It is found that Fe₇₈Si₉B₁₃ metallic glass exhibits two-stage crystallization on heating. In order to calculate the activation energies for crystallization various thermal models are employed. The average values of the activation energies (E_c) were calculated and found to be 342 ± 10 and 351 ± 8 kJ/mol for the first and second phase, respectively. Kinetic parameters such as Avrami exponent or reaction order (n), dimensionality of growth (m), and frequency factor (K_0) are also discussed. The reaction orders obtained for the two stages of crystallization were $n_1 = 4$ and $n_2 = 5$, confirming the bulk crystallizations of the samples. The deduced K_0 values for the two crystallization peaks are calculated to be 9.8×10^{18} and $4.6 \times 10^{18} \text{ s}^{-1}$. X-ray diffraction (XRD) and scanning electron microscopy (SEM) techniques are used to identify the crystallized phases and morphology of the annealed samples, respectively. Rietveld X-ray profile fittings are also performed that revealed the obtained phases for the Fe₇₈Si₉B₁₃ metallic glass were cubic α -Fe(Si) and tetragonal Fe₂B with volume fraction of 44% and 56%, respectively. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Crystallization kinetics; DSC; Fe₇₈Si₉B₁₃; Metallic glass; Rietveld analysis

Khan, S.A., Al-Hazmi, F.S., Faidah, A.S., Yaghmour, S.J., Al-Sanosi, A.M., Al-Ghamdi, A.A.

Kinetics of Se₇₅S₂₅-xCd_x glassy system using differential scanning calorimeter

(2009) *Journal of Alloys and Compounds*, 484 (1-2), pp. 649-653.

Department of Physics, Faculty of Science, King Abdul Aziz University, Jeddah, 21589, Saudi Arabia

Abstract

The kinetics of crystallization in Se₇₅S₂₅-xCd_x ($x = 0, 2, 4, 6$ and 8) chalcogenide glasses are studied by non-isothermal methods using differential scanning calorimetry at different heating rates of 5, 10, 15 and 20 K/min. The growth kinetics has been investigated using Kissinger, Matusita and Ozawa models. The values of glass transition temperature (T_g), and crystallization temperatures (T_c) are found to be composition and heating rate dependence. From the heating rate dependence of T_g and T_c , the activation energy for structural relaxation (ΔE_t), the activation energy of crystallization (ΔE_c), crystallization enthalpy (ΔH_c) and the order parameter (n) are calculated. It was observed that the glass transition temperature and crystallization temperatures both increase with increasing heating rates. It was observed that Se₇₅S₂₅ has a minimum value of activation energy of structural relaxation, which indicates that this particular glass has a larger probability to jump to a state of lower configurational energy and higher stability in the glassy region. On the basis of the obtained experimental data the temperature difference ($T_c - T_g$) and the enthalpy released are found to be minimum and maximum, respectively for Se₇₅S₂₁Cd₄ glass, which indicates that this glass is the least stable glass in the composition range of investigation. © 2009.

Author Keywords

Amorphous materials; Calorimetry; Liquid quenching; Thermal analysis; X-ray diffraction

Al-Ghamdi, A.A.^a, Nagat, A.T.^b, Bahabri, F.S.^b, Al-orainy, R.H.^b, Al-harbi, S.R.^b, Al-Hazmi, F.S.^a

Negative-differential-resistance effects in TlInTe₂ ternary semiconductor

(2009) *Journal of Alloys and Compounds*, 484 (1-2), pp. 561-566.

^a Physics Department, Faculty of Science, King Abdulaziz University, Jeddah, 21589, Saudi Arabia

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Abstract

Thallium indium ditelluride single crystals, were prepared by a special high efficiency, low cost, design, constructed locally, based on Bridgman technique. A special perspex sample holder and quartz cryostat were used to investigate the switching phenomena in TlInTe₂ single crystal. Current-controlled negative resistance (CCNR) has been observed for the first time. The switching effect observed in such crystal shows memory. The current-voltage ($i - v$) characteristics of the compound show two different regions: an ohmic region at low-current densities and a negative-differential-resistance (NDR) region at higher current densities. This behavior has been explained by an electrothermal model. The results strongly indicate that the phenomenon in our sample is very sensitive to temperature, light intensity and sample thickness as well. Switching parameters (i_{th} , v_{th} , i_h , v_h , P_{th} and ROFF/RON) are found to depend on the surrounding conditions as well as the sample thickness. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Crystal grow; Electrical transport; Semiconductor

Kadi, M.W.

"Soil Pollution Hazardous to Environment": A case study on the chemical composition and correlation to automobile traffic of the roadside soil of Jeddah city, Saudi Arabia

(2009) *Journal of Hazardous Materials*, 168 (2-3), pp. 1280-1283. Cited 2 times.

King AbdulAziz University, Department of Chemistry, P.O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

Soil samples from different roads in Jeddah city were collected and analyzed for their elemental composition. The effects of traffic conditions were critically investigated to reflect the effect of the heavy and light traffic on the soil composition. Samples were analyzed for K, As, Co, Cr, Ni, Pb, Sb, V, and Zn. The results revealed great dependence of lead and zinc contents on traffic conditions. The lead content lies in the range $0.3-104.8 \pm 0.003$ mg/kg for the samples of high traffic conditions and 0.3 ± 0.0 mg/kg being for the sample with no traffic activity, whereas 104.8 ± 0.003 mg/kg was for the one of the most used highways area in Jeddah city. Zinc level lies in the range $56.59 \pm 0.003-456.93 \pm 0.06$ mg/kg which is quite close to lead pattern. The high zinc concentration was found along the main turn roads. The high zinc content in tested soil samples may come from traffic sources, especially vehicle tires. Concentrations of other elements showed little dependence on traffic conditions. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Inductively coupled plasma-mass spectrometry; Lead and zinc; Roadside dust; Soil pollution; Traffic-related elements

Al-Ghamdi, A.A., Khan, S.A.

Laser-induced changes on optical band gap of amorphous and crystallized thin films of Se75S25-xAGx

(2009) *Physica B: Condensed Matter*, 404 (21), pp. 4262-4266.

Department of Physics, Faculty of Science, King Abdul Aziz University, Jeddah, 21589, Saudi Arabia

Abstract

Optical band gap of amorphous, crystallized, laser induced amorphous and laser induced crystallized films of Se75S25-xAgx (x=4, 6 and 8) glassy alloys was studied from absorption spectra. The amorphous and crystallized films were induced by pulse laser for 10 min. After laser irradiation on amorphous and crystalline films, optical band gap was measured. It has been found that the mechanism of the optical absorption follows the rule of indirect transition. The amorphous thin films show an increase in the optical band gap, while the crystallized (thermally annealed) thin films show a decrease in the optical band gap by inducing laser irradiation. Crystallization and amorphization of chalcogenide films were accompanied with the change in the optical band gap. The change in optical energy gap could be determined by identification of the transformed phase. These results are interpreted in terms of concentration of localized states due to shift in Fermi level. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Chalcogenides; Crystallization; Laser irradiation; Optical band gap; Thin films

Kharal, A.^a, Ahmad, B.^{a b}

On fuzzy soft sets

(2009) *Advances in Fuzzy Systems*, art. no. 586507, .

^a Centre for Advanced Studies in Pure and Applied Mathematics, Bahauddin Zakariya University, 60800 Multan, Pakistan

^b Department of Mathematics, King Abdul Aziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

We further contribute to the properties of fuzzy soft sets as defined and studied in the work of Maji et al. (2001), Roy and Maji (2007), and Yang et al. (2007) and support them with examples and counterexamples. We improve Proposition 3.3 by Maji et al., (2001). Finally we define arbitrary fuzzy soft union and fuzzy soft intersection and prove DeMorgan Inclusions and DeMorgan Laws in Fuzzy Soft Set Theory. © 2009 B. Ahmad and A. Kharal.

Al-Garni, S.M., Ghanem, K.M., Bahobail, A.S.

Biosorption characteristics of *Aspergillus fumigatus* in removal of cadmium from an aqueous solution

(2009) *African Journal of Biotechnology*, 8 (17), pp. 4163-4172.

Biological Sciences Department, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract

Nineteen fungal species were isolated from soil contaminated with industrial wastes of which *Aspergillus* species were

the most dominant. The growth of the isolates was notice by Cd concentration in growth medium, thus about 20% of the isolates can grow up to 50 mg Cd/100 ml medium and only *Aspergillus fumigatus* and *Penicillium chrysogenum* can grow at 100 mg Cd with growth decrease of 88.2 and 99.4%, respectively. The results revealed that the living biomass of the isolates were more efficient to biosorb Cd than their dried powdered biomass by 15 - 44%. The formulation of yeast peptone glucose (YPG) medium fortified the isolates by ingredients favored the best growth yields that have the highest Cd biosorption, compared to yeast malt extract (YM) and sabourad (Sb) media. The dried *A. fumigatus* biomass was the most efficient than other tested fungi. The influence of different treatments of dried *A. fumigatus* biomass on its Cd biosorption activity, indicated that 0.5 N NaOH and autoclaving was the most efficient treatment (3 fold increase as compared to untreated). The biosorption of Cd by treated *A. fumigatus* biomass was considerably influenced by the pH value of the biosorption medium, contact time, biomass levels and Cd concentration. Thus, 98% of Cd was absorbed in biosorption medium containing 10 mg Cd and 100 mg dried treated biomass/100ml bidistilled water at pH 5 after 90 min of contact, nitric acid (0.05 N) was the best Cd eluent (99.8%) as compared to the other eluents. The desorbed *A. fumigatus* biomass was successfully reused for 5 consecutive times for Cd biosorption with decrease reached to 28% at the 5th reuse. © 2009 Academic Journals.

Author Keywords

Aspergillus fumigatus; Biomass; Biosorption; Cadmium; Industrial wastes

Zegeye, H.^a, Shahzad, N.^b

Convergence theorems for strongly continuous semi-groups of asymptotically nonexpansive mappings
(2009) *Nonlinear Analysis, Theory, Methods and Applications*, 71 (5-6), pp. 2308-2315.

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Abstract

Let K be a nonempty closed convex subset of a real Banach space E . Let $T = \{T(t) : t \in \mathbb{R}^+\}$ be a strongly continuous semi-group of asymptotically nonexpansive mappings from K into K with a sequence $\{L_t\} \subset [1, \infty)$. Suppose $F(T) \neq \emptyset$. Then, for a given $u_0 \in K$ and $t_n \rightarrow \infty$; $0 < \alpha_n < 1$ and $\sum_{n=1}^{\infty} \alpha_n = \infty$, where $t_n \in \mathbb{R}^+$. Suppose, in addition, that E is reflexive strictly convex with a uniformly Gâteaux differentiable norm and that $\lim_{n \rightarrow \infty} \frac{L_{t_n} - 1}{\alpha_n} = 0$. Then the sequence $\{u_n\}$ converges strongly to a point of $F(T)$. Moreover, it is proved that an explicit sequence $\{x_n\}$ generated from $x_1 \in K$ by $x_{n+1} = \alpha_n u_n + (1 - \alpha_n) T(t_n) x_n$, $n \geq 1$, converges to a fixed point of T . © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

Asymptotically nonexpansive mappings; Fixed points; Nonexpansive mappings; Strongly continuous semi-groups of asymptotically nonexpansive mappings; Strongly continuous semi-groups of nonexpansive mappings

Al-Luhaibi, N.S., Al-Solamy, F.R., Khan, V.A.

CR-warped product submanifolds of nearly Kaehler manifolds
(2009) *Journal of the Korean Mathematical Society*, 46 (5), pp. 979-995.

Department of Mathematics, King AbdulAziz University, P. O. Box 80015, Jeddah 21589, Saudi Arabia

Abstract

As warped product manifolds provide an excellent setting to model space time near black holes or bodies with large gravitational field, the study of these manifolds assumes significance in general. B. Y. Chen [4] initiated the study of CR-warped product submanifolds in a Kaehler manifold. He obtained a characterization for a CR-submanifold to be locally a CR-warped product and an estimate for the squared norm of the second fundamental form of CR-warped products in a complex space form (cf [6]). In the present paper, we have obtained a necessary and sufficient conditions in terms of the canonical structures P and F on a CR-submanifold of a nearly Kaehler manifold under which the submanifold reduces to a locally CR-warped product submanifold. Moreover, an estimate for the second fundamental form of the submanifold in a generalized complex space is obtained and thus extend the results of Chen to a more general setting. © 2009 The Korean Mathematical Society.

Author Keywords

Canonical structure; CR-submanifold; CR-warped product submanifold; Generalized complex space form; Nearly Kaehler manifold

Baeshin, N.A.^a, Lari, S.A.^b, Al Doghaither, H.A.^a, Elkady, A.I.^a

Effects of aqueous extracts of *Rhazya stricta* on blood lipid profile concentrations, liver enzyme activities and kidney functions in rats

(2009) *Journal of Applied Sciences Research*, 5 (9), pp. 1103-1109.

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^b Department of Biochemistry, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract

Rhazya stricta (*R. stricta*) is an important medicinal species used in indigenous medicinal herbal drugs to cure various diseases in South Asia and Middle East Countries. Over 100 alkaloids have been isolated, characterized and identified from *R. stricta* leaves, stems, roots and legumes and mixtures of aerial parts. Most of these are new chemical compounds, but the pharmacological activities of very few of them are known. The importance of *R. stricta* in folk medicine has therefore prompted us to evaluate the beneficial effects of oral administration of extracts of the *R. stricta* leaves on serum lipid profile concentrations, the activity of liver enzymes and the kidney functions, using doses comparable to those applied by humans in the folkloric medicine. To achieve this goal, fifty five male Wistar rats were divided into four groups as follows: group 1 (control, n= 10) received a daily single oral dose of 0.5 ml of distilled water, groups 2, 3 and 4 (each of 15), each animal received a daily single oral dose of 0.5 ml of distilled water containing 0.1 gm/ml (group 2), 0.125 gm/ml (group 3) and 0.150 gm/ml (group 4) of the *Rhazya* leaf aqueous extract, for 18 weeks. Blood samples were collected, after an overnight fast, 1, 2, 4, 8, 12 and 18 weeks post-treatment. The aqueous extract of the *R. stricta* leaves significantly decreased concentrations of TGs, LDL-c, cholesterol, uric acid and creatinin, but increased concentration of HDL-c. It triggered all these activities without affecting liver enzyme activities or kidney functions. These findings may have a positive impact on the ocardiovascular patients and may provide a new therapeutic strategy to reduce hypertriglyceridemia. © 2009, INSInet Publication.

Author Keywords

Aqueous extracts; Lipid profile; Liver enzymes; *Rhazya stricta*; Uric acid

El-Sebaili, A.A., Al-Ghamdi, A.A., Al-Hazmi, F.S., Faidah, A.S.

Estimation of global solar radiation on horizontal surfaces in Jeddah, Saudi Arabia

(2009) *Energy Policy*, 37 (9), pp. 3645-3649.

Physics Department, Faculty of Science, King Abdul Aziz University, P. O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

The measured data of global solar radiation on a horizontal surface, as well as the number of sunshine hours, mean daily ambient temperature, maximum and minimum ambient temperatures, relative humidity and amount of cloud cover, for Jeddah (latitude 21° 42'37"N, longitude 39° 11'12"E), Saudi Arabia for the period 1996-2006 are analyzed. The data are divided into two sets. The sub-data set 1 (1996-2004) are employed to develop empirical correlations between the monthly average of daily global solar radiation fraction (H/H0) and various meteorological parameters. The nonlinear Angström type model developed by Sen and the trigonometric function model proposed by Bulut and Büyükalaca are also evaluated. New empirical constants for these two models have been obtained for Jeddah. The sub-data set 2 (2005, 2006) are then used to evaluate the derived correlations. Comparisons between measured and calculated values of H have been performed. It is indicated that, the Sen and Bulut and Büyükalaca models satisfactorily describe the horizontal global solar radiation for Jeddah. All the proposed correlations are found to be able to predict the annual average of daily global solar radiation with excellent accuracy. Therefore, the long term performance of solar energy devices can be estimated. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

Global solar radiation; Meteorological data; Regression analysis

Almestady, M.S.^a, Morris, A.O.^b

Fischer matrices for projective representations of generalized symmetric groups

(2009) *Algebra Colloquium*, 16 (3), pp. 449-462.

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Abstract

The aim of this work is to calculate the Fischer matrices for the covering groups of the Weyl group of type B_n and the generalized symmetric group. It is shown that the Fischer matrices are the same as those in the ordinary case for the classes of S_n which correspond to partitions with all parts odd. For the classes of S_n which correspond to partitions in which no part is repeated more than m times, the Fischer matrices are shown to be different from the ordinary case. © 2009 Academy of Mathematics and Systems Science, Chinese Academy of Sciences, and Suzhou University.

Author Keywords

Generalized symmetric groups; Projective representations

Malik, M.A.^a, Khan, Z.^{a, b}

Role of cetyltrimethylammonium bromide (cationic surfactant) on the tryptophan-MnO₄⁻ reaction

(2009) *Colloids and Surfaces B: Biointerfaces*, 72 (2), pp. 253-258.

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Abstract

Upon addition of permanganate to a solution of tryptophan (Trp), yellow-brown color species appears within the time of mixing of tryptophan in absence and presence of cetyltrimethylammonium bromide (CTAB), which was stable for some days. Spectroscopic and kinetic evidences suggest the formation of water-soluble colloidal MnO₂ as the most stable reduction product of MnO₄⁻. Carbon dioxide and ammonia are not formed as the oxidation products. Carbon-carbon double bond of indole moiety of Trp is responsible for the fast reduction of permanganate. Cetyltrimethylammonium bromide catalyses the permanganate oxidation of Trp with a rate enhancement of ca. 200-fold. Sub- and postmicellar catalytic effect of CTAB ascribed to the association/incorporation/solubilization of both reactants (MnO₄⁻ and Trp) with the CTAB aggregates and into the Stern layer of cationic micelles. Quantitative kinetic analysis of the rate constant-[CTAB] data has been performed on the basis of modified pseudo-phase model of the micelles. A comparison was made of the oxidation rates of different amino acids by permanganate. The order of the effectiveness was as follows: tryptophan >> tyrosine >> phenylalanine. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Catalysis; CTAB; MnO₄⁻; Oxidation; Surfactants; Tryptophan

Ibrahim, M.M.^{a, b}, Al-Juaid, S.S.^c, Mohsen, Q.^b

Synthesis and characterization of 2-mercapto-1-cyclohexylimidazole-based zinc(II) and cadmium(II) bromide complexes: The crystal structure of [Zn(Hmimchexyl)₂(Br)₂] with N-HBr intermolecular hydrogen bonding interactions

(2009) *Phosphorus, Sulfur and Silicon and the Related Elements*, 184 (9), pp. 2324-2332.

^a Chemistry Department, Faculty of Science, Kafrelsheik University, Kafrelsheik, Egypt

^b Chemistry Department, Faculty of Science, Taif University, Taif, Saudi Arabia

^c Chemistry Department, Faculty of Science, King Abd Al Aziz University, Jeddah, Saudi Arabia

Abstract

Reactions of the ligand 2-mercapto-1-cyclohexylimidazole (Hmim^{chexyl}) with both zinc(II) and cadmium(II) bromides in ethanol solutions afforded 2:1 complexes of the type [M(Hmim^{chexyl})₂(Br)₂] (M = Zn 1, and Cd 2) with an MBr₂S₂ configurations. Spectroscopic evidence (FT-IR and ¹³C NMR) confirms that the exocyclic thione sulfur atoms are the donors in both complexes. Complex 1 crystallizes in a monoclinic system, space group C2/c, a = 16.180(3), b = 10.817(5), c = 13.602(3); α = 90, β = 106.754(17), γ = 90; Z = 4; R₁ = 0.0229, wR₂ = 0.0554. The coordination geometry about the zinc(II) atom is distorted tetrahedral with average Zn-S and Zn-Br bond lengths of 3.3418(8) and 2.4017(6) Å, respectively. The bromide ions form intermolecular N-H...Br hydrogen bonding with the thione NH groups of the ligand molecule.

Author Keywords

Cadmium(II) complex; Crystal structure; Hydrogen bonding; Mercaptoimidazole; Zinc(II) complex

Abdalla, S.

Electric field perturbation due to impurities in GaAs through single electron transistor

(2009) *Physica B: Condensed Matter*, 404 (21), pp. 4243-4245.

Physics Department, Faculty of Science, King Abdulaziz University Jeddah, P.O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

The present work shows the presence of inevitable impurities in the semi-insulating GaAs domains when one is developing a single electron transistor (SET) and alters the quantization mechanism of single electron tunneling through the island. It is also indicated that these impurities decrease the amount of energy required to change the number of electrons on the island, which leads to a drastic reduction of SET quality. A theoretical model has been

presented for elucidating the I-V characteristics of GaAs nano-crystals. It is found that this proposed model fits well the experimental data. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Charge quantization; Impurity; Potential; Single electron transistor (SET)

Ahmad, B., Alghamdi, B.S.

Approximate solutions of the forced duffing equation with mixed nonlinearities?

(2009) *Applied Mathematics E - Notes*, 9, pp. 160-167.

Department of Mathematics, Faculty of Science, King Abdulaziz University, P.O. Box. 80203, Jeddah 21589, Saudi Arabia

Abstract

In this paper, an improved form of the generalized quasilinearization technique is developed to obtain a monotone sequence of approximate solutions converging uniformly and quadratically to a unique solution of the forced Duffing equation involving mixed nonlinearities with periodic boundary conditions.

Ahmad, B.^a, Nieto, J.J.^b

Existence of solutions for nonlocal boundary value problems of higher-order nonlinear fractional differential equations

(2009) *Abstract and Applied Analysis*, 2009, art. no. 494720, . Cited 2 times.

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^b Departamento de Análisis Matemático, Facultad de Matemáticas, Universidad de Santiago de Compostela, 15782 Santiago de Compostela, Spain

Abstract

We study some existence results in a Banach space for a nonlocal boundary value problem involving a nonlinear differential equation of fractional order q given by ${}^c D^q x(t) = f(t, x(t))$, $0 < t < 1$, $q \in (m-1, m]$, $m \in \mathbb{N}$, $m \geq 2$, $x(0) = 0$, $x'(0) = 0$, $x^{(m-2)}(0) = 0$, $x^{(m-2)}(1) = \alpha x(n)$. Our results are based on the contraction mapping principle and Krasnoselskii's fixed point theorem. Copyright © 2009 B. Ahmad and J. J. Nieto.

Asiri, A.M.^a, Khan, S.A.^a, Ng, S.W.^b

(2E,2'E)-1,1'-Bis(2,5-dimethyl-3-thien-yl)-3, 3'-(p-phenyl-ene)diprop-2-en-1-one

(2009) *Acta Crystallographica Section E: Structure Reports Online*, 65 (8), pp. o1726.

^a Chemistry Department, Faculty of Science, King Abdul Aziz University, Jeddah, Saudi Arabia

^b Department of Chemistry, University of Malaya, 50603 Kuala Lumpur, Malaysia

Abstract

In the title bis-chalcone, C₂₄H₂₂O₂S₂, the -C(O)CH=CH-C₆H₄-CH=CHC(O)- portion is planar (r.m.s. deviation = 0.04 Å); one thienyl ring is aligned at 8.8 (1)° with respect to this fragment, whereas the other is aligned at 21.3 (1)°. © 2009 Asiri et al.

Asiri, A.M.^a, Khan, S.A.^a, Ng, S.W.^b

5-[3-(2,5-Dimethoxy-phen-yl)prop-2-enyl-idene]-1,3-diethyl-2-thioxohexa- hydro-pyrimidine-4,6-dione

(2009) *Acta Crystallographica Section E: Structure Reports Online*, 65 (8), pp. o1820.

^a Chemistry Department, Faculty of Science, King Abdul Aziz University, Jeddah, Saudi Arabia

^b Department of Chemistry, University of Malaya, 50603 Kuala Lumpur, Malaysia

Abstract

1,3-Diethyl-2-thio-barbituric acid reacts with 2,5-dimethoxy-benzaldehyde to form the title Knoevenagel product, C₁₉H₂₂N₂O₄S. In the compound, the two six-membered rings at either end of the three-membered -CHCHCH- chain are nearly coplanar with this fragment (r.m.s. deviation of the two six-membered rings and the three chain atoms = 0.08 Å). © 2009 Asiri et al.

Asiri, A.M.^a, Ng, S.W.^b

(E)-4-(2,5-Dimethoxy-benzyl-idene)-2-phenyl-1,3-oxazol-5(4H)-one

(2009) *Acta Crystallographica Section E: Structure Reports Online*, 65 (8), pp. o1746.

^a Chemistry Department, Faculty of Science, King Abdul Aziz University, Jeddah, Saudi Arabia

^b Department of Chemistry, University of Malaya, 50603 Kuala Lumpur, Malaysia

Abstract

The central aza-lactone ring in the title compound, C₁₈H₁₅N₂O₄, is planar (r.m.s. deviation 0.05, 0.12 Å) in both independent mol-ecules comprising the asymmetric unit. The benzyl-idene substituent is coplanar with this ring [dihedral angle between the planes = 1.8 (1)° in the first mol-ecule and 2.8 (1)° in the second], as is the phenyl substituent [dihedral angle between rings = 4.6 (1) and 9.7 (1)°, respectively]. © 2009 Asiri and Ng.

Hassan, H.F.^{a b}, Kusmartsev, F.V.^a

Flux cloning anomalies in josephson nano-junctions

(2009) *International Journal of Modern Physics B*, 23 (20-21), pp. 4345-4351.

^a Department of Physics, Loughborough University, Leicestershire LE11 3TU, United Kingdom

^b Department of Physics, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract

The propagation of single flux quanta in T-shaped Josephson junctions gives rise to the flux cloning phenomenon. We have studied numerically the dynamics of flux cloning in cases of extended Josephson junctions. The changing thicknesses of T-junctions lead to new and interesting effects in terms of their dynamics. We have found out that when an additional Josephson transmission line is larger than the main Josephson transmission line, numerical simulations do not show the cloning phenomenon and soliton is reflected when it approaches the T junction. This strange result may be happened because the soliton losses more energy in the sharp edge. Although the vortex is moving very highly and it has huge energy but it still does not give birth to a new vortex. We have investigated conditions at which flux cloning occurs when both widths, W and W₀, are changing. © 2009 World Scientific Publishing Company.

Asiri, A.M.^a, Khan, S.A.^a, Ng, S.W.^b

Pyridinium 5-[(1,3-diethyl-6-hydr-oxy-4-oxo-2-thioxo-1,2,3,4-tetra-hydro- pyrimidin-5-yl)(2-methoxy-phen-yl)meth-yl]-1,3-diethyl-4,6-dioxo-2- thioxopyrimidin-5-ide

(2009) *Acta Crystallographica Section E: Structure Reports Online*, 65 (8), pp. o1860-o1861.

^a Chemistry Department, Faculty of Science, King Abdul Aziz University, Jeddah, Saudi Arabia

^b Department of Chemistry, University of Malaya, 50603 Kuala Lumpur, Malaysia

Abstract

1,3-Diethyl-2-thio-barbituric acid reacts with 2-anisaldehyde to form the Michael addition product 2-anisylbis(1,3-diethyl-2-thio-barbitur-5-yl)methanate, which crystallizes as the title pyridinium salt, C₅H₆N⁺·C₂₄H₂₉N₄O₅S₂, when it reacts with the pyridine used to catalyse the reaction. There are two independent ion pairs in the crystal structure. The anion features a methine C atom connected to three six-membered rings; one of the rings carries a hydr-oxy group, which engages in hydrogen bonding with the carbonyl group belonging to another ring. The monoclinic unit cell emulates an ortho-rhom-bic unit cell, and is a twin with a minor twin component of 35%. © 2009 Asiri et al.

Ahmad, B.

Existence of solutions for fractional differential equations of order $q \in (2,3]$ with anti-periodic boundary conditions

(2009) *Journal of Applied Mathematics and Computing*, pp. 1-7. Article in Press.

Department of Mathematics, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

In this paper, we prove the existence of solutions for an anti-periodic boundary value problem of fractional differential equations of order $q \in (2,3]$. The contraction mapping principle and Krasnoselskii's fixed point theorem are applied to establish the results. © 2009 Korean Society for Computational and Applied Mathematics.

Author Keywords

Anti-periodic boundary conditions; Contraction principle; Existence; Fractional differential equations; Krasnoselskii's fixed point theorem

in Press

Khan, S.A., Al-Ghamdi, A.A.

Influence of laser-irradiation on the optical constants Se75S25 - xCdx thin films

(2009) *Materials Letters*, 63 (20), pp. 1740-1742.

Department of Physics, Faculty of Science, King Abdul Aziz University, Jeddah, 21589, Saudi Arabia

Abstract

Amorphous thin films of glassy alloys of Se75S25 - xCdx ($x = 2, 4$ and 6) were prepared by thermal evaporation onto chemically cleaned glass substrates. Optical absorption and reflection measurements were carried out on as-deposited and laser-irradiated thin films in the wavelength region of 500-1000 nm. Analysis of the optical absorption data shows that the rule of no-direct transitions predominates. The laser-irradiated Se75S25 - xCdx films showed an increase in the optical band gap and absorption coefficient with increasing the time of laser-irradiation. The results are interpreted in terms of the change in concentration of localized states due to the shift in Fermi level. The value of refractive index increases decreases with increasing photon energy and also by increasing the time of laser-irradiation. With the large absorption coefficient and change in the optical band gap and refractive index by the influence of laser-irradiation, these materials may be suitable for optical disc application. © 2009.

Author Keywords

Absorption coefficient; Laser-irradiation; Optical materials and properties; Semiconductors; Thin films

Harbi, H.M.^a, Eldougoug, A.A.^a, El-Shahawi, M.S.^b

Mineral processing and extraction of rare earth elements from the Wadi Khamal Nelsonite Ore, Northwestern Saudi Arabia

(2009) *Arabian Journal of Geosciences*, pp. 1-11. Article in Press.

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Abstract

A technological sample (50 kg) from Wadi Khamal Nelsonite ore was subjected to magnetic and flotation concentration techniques. Excellent recovery percentages of 72.95% and 71.22% were achieved by the dry/wet magnetic and flotation concentration techniques, respectively. The weight of the apatite concentrate reached a reasonable percentage of approximately 23.5% with an overall 40.23% P2O5 total content. Analytical data of the apatite concentrate after digestion in concentrated sulfuric acid revealed that the total content of the rare earth elements (REE) constitutes about 0.2% of the total apatite content. The REE content (0.2%) was partitioned between phosphoric acid liquor (65%) and gypsum precipitate (36%). The extraction of the REEs from the phosphoric acid liquor using oxalic acid and sodium carbonate-bicarbonate mixture (1:10 w/w) yielded the RE oxide cake which constitute about 1.2% (w/w). The produced rare earth oxide cake contains traces of various metal oxides, e.g., SrO, Na2O, etc. in addition to rare earth oxides. Attempts to determine quantitatively the constituents of the cake will be considered in future work. © 2009 Saudi Society for Geosciences.

Author Keywords

Gypsum precipitate; Mineral processing; Phosphoric acid liquor; Rare earth elements; Saudi Arabia

in Press

Ahmad, B.^a, Otero-Espinar, V.^b

Existence of solutions for fractional differential inclusions with antiperiodic boundary conditions

(2009) *Boundary Value Problems*, 2009, art. no. 625347, . Cited 2 times.

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^b Departamento de Análisis Matemático, Facultad de Matemáticas, Universidad de Santiago de Compostela, 15782 Santiago de Compostela, Spain

Abstract

We study the existence of solutions for a class of fractional differential inclusions with anti-periodic boundary conditions. The main result of the paper is based on Bohnenblust-Karlins fixed point theorem. Some applications of the main result are also discussed.

Kutbi, M.A., Latif, A.

Fixed points of multivalued maps in modular function spaces

(2009) *Fixed Point Theory and Applications*, 2009, art. no. 786357, .

Department of Mathematics, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

The purpose of this paper is to study the existence of fixed points for contractive-type and nonexpansive-type multivalued maps in the setting of modular function spaces. We also discuss the concept of w-modular function and prove fixed point results for weakly-modular contractive maps in modular function spaces. These results extend several similar results proved in metric and Banach spaces settings.

Ahmad, B.^{a b}, Kharal, A.^a

Fuzzy sets fuzzy s-open and s-closed mappings

(2009) *Advances in Fuzzy Systems*, art. no. 303042, .

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^b Department of Mathematics, King Abdul Aziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

Several properties of fuzzy semiclosure and fuzzy semi-interior of fuzzy sets defined by Yalvac (1988), have been established and supported by counterexamples. We also study the characterizations and properties of fuzzy semi-open and fuzzy semi-closed sets. Moreover, we define fuzzy s-open and fuzzy s-closed mappings and give some interesting characterizations. Copyright © 2009 B. Ahmad and A. Kharal.

Ghanem, K.M., Al-Garni, S.M., Al-Shehri, A.N.

Statistical optimization of cultural conditions by response surface methodology for phenol degradation by a novel *Aspergillus flavus* isolate

(2009) *African Journal of Biotechnology*, 8 (15), pp. 3576-3583.

Biological Sciences Department, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract

Phenol is a hydrocarbon compound that highly pollutes the environment. *Aspergillus flavus* having high ability to degrade phenol was isolated. The fungus fully degraded phenol concentration of 100 mg l⁻¹ in 72 h, 300 mg l⁻¹ in 96 h, 500 mg l⁻¹ in 120 h, 700 mg l⁻¹ in 240 h, while 900 and 1000 mg l⁻¹ needed more than 240 h. On the other hand, 2000 and 3000 mg l⁻¹ was lethal to the fungal growth. Statistical designs of the multi-factorial experiment consisting of two serial designs (Plackett-Burman and Box-Behnken) were applied to optimize medium components and growth conditions to raise the fungus potency for phenol degradation and to reduce required time. The fungus achieved 100% (of 500 mg l⁻¹) phenol degradation in 99 h, after application of Plackett-Burman design. The design reduced required time for phenol degradation from 120 to 99 h. And after application of Box-Behnken design, the required time to complete phenol degradation became 97 h instead of 99 h. So the statistical programs raised the fungus efficiency by 20% and reduced required time to complete phenol degradation from 120 to 97 h. These results were applied for the bioremediation of the crude sewage containing phenol concentration of 0.7 mg l⁻¹, which was obtained from the main track of Makkah sewage, where *A. flavus* completed phenol degradation with optimized conditions in four hours. This efficiency proved the ability of this fungus to remove the phenolic compounds from pollution. © 2009 Academic Journals.

Author Keywords

Aspergillus flavus; Phenol degradation; Statistical design

Zenkour, A.M.^a, Mashat, D.S.^b

Exact solutions for variable-thickness inhomogeneous elastic plates under various boundary conditions

(2009) *Meccanica*, 44 (4), pp. 433-447.

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Abstract

In this paper, an exact solution to the governing equations of the bending of a variable-thickness inhomogeneous rectangular plate is presented. The procedure is applicable to variable-thickness inhomogeneous rectangular plates with two opposite edges simply supported. The remaining ones subjected to a combination of clamped, simply supported, and free boundary conditions and between these two edges the plate may have varying thickness. The procedure is valuable in view of the fact that tables of deflections and stresses cannot be presented for variable-thickness inhomogeneous orthotropic plates as for uniform-thickness homogeneous isotropic plates even for commonly encountered loads because the results depend on the inhomogeneity coefficient and the orthotropic material properties instead of a single flexural rigidity. Numerical results, useful for the validation or otherwise of approximate solutions, are tabulated. The influences of the degree of the inhomogeneity, aspect ratio, thickness parameter and degree of non-uniformity on the deflections and stresses are investigated. © 2008 Springer Science+Business Media B.V.

Author Keywords

Boundary conditions; Inhomogeneous; Orthotropic; Variable-thickness

Ahmad, B.^a, Sivasundaram, S.^b

Existence results for nonlinear impulsive hybrid boundary value problems involving fractional differential equations

(2009) *Nonlinear Analysis: Hybrid Systems*, 3 (3), pp. 251-258. Cited 2 times.

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Abstract

In this paper, we discuss some existence results for a two-point boundary value problem involving nonlinear impulsive hybrid differential equation of fractional order $q \in (1, 2]$. Our results are based on contraction mapping principle and Krasnoselskii's fixed point theorem. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

Existence; Fixed point theorem; Impulse; Nonlinear fractional differential equations; Two-point boundary conditions

Shahzad, N.^a, Zegeye, H.^b

On Mann and Ishikawa iteration schemes for multi-valued maps in Banach spaces

(2009) *Nonlinear Analysis, Theory, Methods and Applications*, 71 (3-4), pp. 838-844.

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^b Bahir Dar University, P.O.Box. 859, Bahir Dar, Ethiopia

Abstract

We prove strong convergence theorems for the Ishikawa iteration scheme involving quasi-nonexpansive multi-valued maps. We also construct an iteration scheme which removes a restrictive condition in Song and Wang results [Y. Song, H. Wang, Erratum to "Mann and Ishikawa iterative processes for multivalued mappings in Banach spaces" [Comput. Math. Appl. 54 (2007) 872-877], Comput. Math. Appl. 55 (2008) 2999-3002]. Our results provide an affirmative answer to Panyanak's question [Mann and Ishikawa iterative processes for multivalued mappings in Banach spaces, Comput. Math. Appl., 54 (2007), 872-877], in a more general setting. © 2008 Elsevier Ltd. All rights reserved.

Author Keywords

Banach space; Fixed point; Nonexpansive multi-valued map; Quasi-nonexpansive multimap; Strong convergence

Ahmad, B.

Stability in terms of two measures for perturbed impulsive delay integro-differential equations

(2009) *Applied Mathematics and Computation*, 214 (1), pp. 83-89.

Department of Mathematics, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

In this paper, we study the stability criteria in terms of two measures for perturbed delay integro-differential equations with fixed moments of impulsive effect by using variational Lyapunov method together with a comparison principle. © 2009.

Author Keywords

Comparison principle; Perturbed impulsive delay integro-differential equations; Stability in terms of two measures; Variational Lyapunov method

El-Sebaili, A.A., Al-Hazmi, F.S., Al-Ghamdi, A.A., Yaghmour, S.J.

Global, direct and diffuse solar radiation on horizontal and tilted surfaces in Jeddah, Saudi Arabia
Applied Energy, . Article in Press.

Physics Department, Faculty of Science, King Abdul Aziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

The measured data of global and diffuse solar radiation on a horizontal surface, the number of bright sunshine hours, mean daily ambient temperature, maximum and minimum ambient temperatures, relative humidity and amount of cloud cover for Jeddah (lat. 21°42'37''N, long. 39°11'12''E), Saudi Arabia, during the period (1996-2007) are analyzed. The monthly averages of daily values for these meteorological variables have been calculated. The data are then divided into two sets. The sub-data set I (1996-2004) are employed to develop empirical correlations between the monthly average of daily global solar radiation fraction (H/H_0) and the various weather parameters. The sub-data set II (2005-2007) are then used to evaluate the derived correlations. Furthermore, the total solar radiation on horizontal surfaces is separated into the beam and diffuses components. Empirical correlations for estimating the diffuse solar radiation incident on horizontal surfaces have been proposed. The total solar radiation incident on a tilted surface facing south H_t with different tilt angles is then calculated using both Liu and Jordan isotropic model and Klucher's anisotropic model. It is inferred that the isotropic model is able to estimate H_t more accurate than the anisotropic one. At the optimum tilt angle, the maximum value of H_t is obtained as ~ 36 (MJ/m²/day) during January. Comparisons with 22 years average data of NASA SSE Model showed that the proposed correlations are able to predict the total annual energy on horizontal and tilted surfaces in Jeddah with a reasonable accuracy. It is also found that at Jeddah, the solar energy devices have to be tilted to face south with a tilt angle equals the latitude of the place in order to achieve the best performance all year round. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

Meteorological parameters; Regression analysis; Solar radiation; Sunshine hours; Tilted surfaces

in Press

Soliman, H.S.^{a, b}, El-Barry, A.M.A.^a, Yaghmour, S.^b, Al-Solami, T.S.^b

Effects of γ -irradiation and heat treatment on structural, spectral and optical parameters of pyronine G(Y) thin films

(2009) *Journal of Alloys and Compounds*, 481 (1-2), pp. 390-396. Cited 1 time.

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^b Physics Department, Faculty of Science, King Abdul Aziz University, Jeddah, Saudi Arabia

Abstract

The structural properties of both powder and thermally evaporated pyronine G(Y) thin films have been investigated, using X-ray diffraction technique as well as scanning electron microscope and Fourier transformation infrared FTIR. The powder diffraction pattern has been indexed for the first time. The spectral and the optical parameters have been investigated by using the spectrophotometric measurements of both transmittance and reflectance at normal incidence of light in the wavelength range 200-2500 nm. All the optical investigations have been carried out for the as deposited, annealed (at 393 K/2 h under vacuum) and γ -irradiated does (by total dose 150 kGy) thin films. Some of the important spectral parameters, namely molar extinction coefficient, oscillator strength and electric dipole strength of the principle optical transitions have been evaluated. The fundamental and the onset indirect energy gaps have been also estimated. The refractive index as a function of wavelength has showed an anomalous dispersion in the absorption region as well as normal dispersion in the transparent region. From analysis of the dispersion curves in the non-absorbing region, the dielectric constants and the dispersion parameters have been obtained. The temperature dependence of the electrical resistivity gives two activation energies related to the extrinsic and intrinsic conduction that depend on the temperature range. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

γ -Irradiation; Pyronine G(Y); Thin films

Al-Ghamdi, F.A.^{a, b}, Al-Zahrani, H.S.^a, Al-Amer, K.H.^a

Phytosociological studies of *Citrullus colocynthis* L., Growing in different altitudinal sites in Saudi Arabia
(2009) *Pakistan Journal of Biological Sciences*, 12 (10), pp. 779-785.

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^b Faculty of Science, Northern Boarder University, Arar, Saudi Arabia

Abstract

The aim of the present study was to survey and record the plant species associated with *Citrullus colocynthis* in different altitudinal localities in the West of Saudi Arabia. Depending on the presence of *Citrullus colocynthis* L. species, seven stands on the West of Saudi Arabia; extending from 25 m up to 2220 m a.s.l. height and 330 km long were selected for this study. Soil samples were collected from the studied localities and the soil properties were investigated. Also, plant species associated with *C. colocynthis* were collected, recorded and prepared as herbarium specimens. The studied localities were represented by different ecological, geographical and edaphic sites. A list of 127 species belonging to 41 families present in all locations was recorded. *Calotropis procera* was the representative species with *C. colocynthis* in all localities. The percentage of presence of the associated species were different between species in each location and also from location to other. Three different ecological areas could be distinguished in the study area. The area near the red sea characterized by salty sandy soil and low vegetation represented the first area. The second one was the coastal plain and West slope which characterized by low rainfall and xerophytic plants. The third one was the mountainous area which characterized by high altitude, more rainfall and high density of vegetation. © 2009 Asian Network for Scientific Information.

Author Keywords

Citrullus colocynthis; Geographical areas; Phytosociological; Plant list

Meziani, L.

A simple integral representation for bounded operators in topological vector spaces

(2009) *Applied Mathematical Sciences*, 3 (17-20), pp. 861-868.

Department of Mathematics, Faculty of Science, King Abdulaziz University, P.O Box 80203, Jeddah 21589, Saudi Arabia

Abstract

Let E be a locally convex Hausdorff space and let E' be its topological dual, endowed with the weak* topology $\sigma(E', E)$. Let S be a compact space and let us consider the space $C(S, E')$ of all continuous functions $f: S \rightarrow E'$, equipped with the uniform topology. In this paper, we prove a simple integral representation theorem, by means of weak integrals against a scalar measure on S , for a class of linear bounded operators $T: C(S, E') \rightarrow E'$. When $E = \mathfrak{S}$ is the Schwartz space on \mathbb{R}^n (thus \mathfrak{S}' is the space of tempered distributions), we prove that bounded operators of this class preserve the familiar operations of distribution theory, that is, the operations of derivation and Fourier transform. Also we give an application to weak sequential convergence in this class of operators.

Author Keywords

Bounded operators; Riesz Theorem; Weak integrals

Triki, H.^a, Ismail, M.S.^b

Solitary wave solutions for a coupled pair of mKdV equations

Applied Mathematics and Computation, . Article in Press.

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^b Department of Mathematics, College of Science, King Abdulaziz University, Jeddah 21589, Saudi Arabia

Abstract

Propagation of weakly nonlinear long waves is studied within the framework of a system of two coupled modified Korteweg-de Vries equations. We investigate analytically and numerically the various families of soliton states for the considered model. By scaling the functions and variables we find that the resulting coupled pair of equations has only one combined parameter. This parameter depends on the wave speed and the coupling coefficient. Explicit analytical expressions for both of the symmetric and antisymmetric states are determined. Numerical method is derived to solve the proposed system, many numerical tests have been conducted to study the behavior of the solution, and the existence of the asymmetric soliton states is displayed numerically. © 2009.

Author Keywords

Finite difference method; Modified Korteweg-de Vries equation; Soliton solution

in Press

Alvi, M.A.

Neutron-¹²C elastic scattering at 96 MeV

(2009) *Journal of Physics G: Nuclear and Particle Physics*, 36 (5), art. no. 055103, .

Faculty of Science, Department of Physics, King Abdulaziz University, Jeddah 21589, Saudi Arabia

Abstract

Recent neutron elastic scattering differential cross section data for ^{12}C at 96 MeV have been analysed within the framework of the Glauber model, suitably modified to enlarge the angular range of validity. The ground-state pair correlation correction has been considered. The effects of the medium-modified nucleon-nucleon (NN) total cross section and the phase variation of the NN scattering amplitude on the calculated cross sections have also been studied. The neutron differential cross sections have been calculated using the phenomenological target density. We find that our method of analysis gives a better description of experimental data than those with the optical model potential. © 2009 IOP Publishing Ltd.

Alsaedi, A., Ahmad, B.

Existence and analytic approximation of solutions of duffing type nonlinear integro-differential equation with integral boundary conditions

(2009) *Journal of Inequalities and Applications*, 2009, art. no. 193169, .

Department of Mathematics, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

A generalized quasilinearization technique is developed to obtain a sequence of approximate solutions converging monotonically and quadratically to a unique solution of a boundary value problem involving Duffing type nonlinear integro-differential equation with integral boundary conditions. The convergence of order $k(k \geq 2)$ for the sequence of iterates is also established. It is found that the work presented in this paper not only produces new results but also yields several old results in certain limits. Copyright © 2009 A. Alsaedi and B. Ahmad.

Salam, M.A.^a, Burk, R.^b

Solid phase extraction of polyhalogenated pollutants from freshwater using chemically modified multi-walled carbon nanotubes and their determination by gas chromatography

(2009) *Journal of Separation Science*, 32 (7), pp. 1060-1068.

^a Chemistry Department, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

^b Ottawa-Carleton Chemistry Institute, Department of Chemistry, Carleton University, Ottawa, ON, Canada

Abstract

This paper describes the application of pristine and chemically modified multi-walled carbon nanotubes (MWCNTs) as packing materials for the preconcentration and determination of various polyhalogenated organic pollutants, pentachlorophenol, 2,4,5-trichlorophenol, 3,3',4,4'-tetrachlorobiphenyl, and 2,2',5,5'-tetrabromobiphenyl from real water samples based on solid-phase extraction. MWCNTs were chemically modified by octadecyl amine and polyethylene glycol, separately, and the resulting nano materials were used as packing materials for solid phase extraction. Method development, applicability, and suitability of the above mentioned adsorbents for the solid phase extraction were studied. Method development showed great reproducibility and sensitivity, and low limits of detection within a considerable linear range. The regeneration and reusability of the SPE cartridges were studied using Rideau River (Ottawa, Canada) surface water samples and the results showed that cartridges could be used for three cycles of adsorption/desorption with no loss of efficiency. In general, the results suggested that modification of MWCNTs affords a novel class of adsorbents, which could be used for the SPE of various analytes from aqueous solutions with great efficiency, recovery, reproducibility, sensitivity, and precision, within a wide range of analyte concentrations. © 2009 Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim.

Author Keywords

Multi-walled carbon nanotubes; Polyhalogenated organic pollutants; Regeneration; Rideau River; Solid-phase extraction

Asiri, A.M.^a, Akkurt, M.^b, Khan, S.A.^a, Arshad, M.N.^c, Khan, I.U.^c, Sharif, H.M.A.^c

2-Benzenesulfonamidobenzoic acid

(2009) *Acta Crystallographica Section E: Structure Reports Online*, 65 (6), pp. o1246-o1247. Cited 3 times.

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^c Department of Chemistry, Government College University, Lahore, Pakistan

Abstract

In the title compound, $\text{C}_{13}\text{H}_{11}\text{NO}_4\text{S}$, the dihedral angle between the planes of the benzene ring and the carboxyl group is $13.7(1)^\circ$. The mol-ecular structure contains intra-molecular N - H...O and C - H...O hydrogen-bonding interactions, while the crystal packing is stabilized by C - H...O and O - H...O hydrogen bonds and C - H...n inter-actions. The O - H...O hydrogen bonds form a cyclic dimer, with graph-set motif R $\langle 2 \rangle_2$ (8), about a centre of symmetry.

Asiri, A.M.^a, Akkurt, M.^b, Khan, S.A.^a, Khan, I.U.^c, Arshad, M.N.^c

(E)-2-Cyano-3-[4-(dimethyl-amino)phen-yl]-N-phenyl-prop-2-enamide

(2009) *Acta Crystallographica Section E: Structure Reports Online*, 65 (6), pp. o1303.

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^c Department of Chemistry, Government College University, Lahore, Pakistan

Abstract

In the title compound, C₁₈H₁₇N₃O, the dihedral angle between the phenyl and benzene rings is 11.22 (14)°. Apart from the methyl H atoms, the mol-ecule is close to planar, with a maximum deviation of 0.145 (3) Å. Intra-molecular C - H...O and C - H...N inter-actions occur. In the crystal, inversion dimers linked by pairs of N - H...N hydrogen bonds occur, resulting in an R²(12) ring motif. Further C - H...N and C - H...O bonds generate R¹(7) and R²(22) motifs and a C - H...n inter-action also occurs.

Sabir, J.S.M.^a, El-Bestawy, E.^b

Enhancement of alkaline protease production in *Bacillus circulans* using plasmid transformation

(2009) *World Journal of Microbiology and Biotechnology*, 25 (11), pp. 2021-2027.

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^b Department of Environmental Studies, Institute of Graduate Studies and Research, Alexandria University, P.O. Box 832, 163 Horria Ave., El-Shatby, Alexandria 21526, Egypt

Abstract

Plasmid transformation is an efficient and crucial biotechnological tool that enables the enhancement of many important microbial characters that would be beneficial in a lot of industrial, agricultural and environmental applications. In the present study, five *Bacillus* species (*B. subtilis*, *B. cereus*, *B. alvei*, *B. circulans* and *B. pumilus*) were investigated. They were isolated from agricultural soils of different local arid environments of the Kingdom of Saudi Arabia, identified and characterized for their plasmid content. The main objective of the present study was to enhance the production of alkaline protease in *Bacillus circulans* (the recipient strain) through plasmid transformation from *B. subtilis* (the donor strain). All the tested *Bacillus* strains successfully produced unique multiple (3, 4 and 5) spontaneous antibiotic resistant mutants against chloramphenicol, neomycin, rifampicin, streptomycin, kanamycin and tetracycline and all of which were mutated to Rif^r strains. *B. pumilus* showed the highest resistance against five of the six tested antibiotics while both of *B. alvei* and *B. circulans* showed the lowest resistance to only three of the tested antibiotics. Results revealed that *B. subtilis* was the best among the tested species concerning the production of alkaline protease (90.2 U/ml) while *B. pumilus* was the lowest in activity (40.3 U/ml). Screening of plasmid content revealed the presence of one or two mega indigenous plasmids in all the tested species. The four transformant strains BC1, BC2, BC3 and BC4 resulting from plasmid transformation exhibited significant increases in the activity of alkaline protease and recorded 2.31- to 3-fold increases compared to the parent *B. circulans* cells and 2.11- to 2.75-fold increases compared to the donor cells of *B. subtilis*. They also acquired antibiotic resistance to tetracycline and chloramphenicol that was completely absent in the parent cells of *B. circulans*. Results revealed that plasmid transformation among the tested *Bacillus* spp. is a powerful technique that can be efficiently exploited to enhance alkaline protease production in the transformed *Bacillus* spp. compared to their wild strains and we recommend using the improved transformant strains for commercial and industrial purposes. © Springer Science+Business Media B.V. 2009.

Author Keywords

Alkaline protease; *B. circulans*; *B. subtilis*; Enhancement; Plasmid transformation

Albukhari, A.A.^a, Gashlan, H.M.^a, El-Beshbishy, H.A.^b, Nagy, A.A.^c, Abdel-Naim, A.B.^d

Caffeic acid phenethyl ester protects against tamoxifen-induced hepatotoxicity in rats

(2009) *Food and Chemical Toxicology*, 47 (7), pp. 1689-1695.

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^b Medical Laboratories Technology Department, Faculty of Applied Medical Sciences, Taibah University, Al-Madinah Al-Munwarah, Saudi Arabia

^c Forensic and Clinical Toxicology, Pathology Department, Faculty of Medicine, Jeddah, Saudi Arabia

^d Pharmacology and Toxicology Department, Faculty of Pharmacy, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract

Tamoxifen (TAM) is widely used in the treatment and prevention of breast cancer. Adverse effects of TAM include hepatotoxicity. Caffeic acid phenethyl ester (CAPE), an active component of propolis, has been used in folk medicine

for diverse ailments. In the current study, the protective effects of CAPE against TAM-induced hepatotoxicity in female rats were evaluated. TAM (45 mg/kg/day, i.p., for 10 consecutive days) resulted in an elevation of serum alanine aminotransferase (ALT), aspartate aminotransferase (AST) and alkaline phosphatase (ALP), depletion of liver reduced glutathione (GSH) and accumulation of oxidized glutathione (GSSG) and lipid peroxidation (LPO). Also, TAM treatment resulted in inhibition of hepatic activity of glutathione reductase (GR), glutathione peroxidase (GPx), superoxide dismutase (SOD) and catalase (CAT). Further, it raised liver tumor necrosis factor-alpha (TNF- α) level and induced histopathological changes. Pretreatment with CAPE (2.84 mg/kg/day; i.p., for 20 consecutive days, starting 10 days before TAM injection) significantly prevented the elevation in serum activity of the assessed enzymes. CAPE significantly inhibited TAM-induced hepatic GSH depletion and GSSG and LPO accumulation. Consistently, CAPE normalized the activity of GR, GPx, SOD and CAT, inhibited the rise in TNF- α and ameliorated the histopathological changes. In conclusion, CAPE protects against TAM-induced hepatotoxicity. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

Caffeic acid phenethyl ester; Hepatotoxicity; Tamoxifen

Mohamed, S.A.^{a, b}, El-Badry, M.O.^b, Hamdy, S.M.^c, Abdel-Ghany, S.S.^b, Salah, H.A.^b, Fahmy, A.S.^b

Fasciola gigantica: Purification and characterization of a leucine aminopeptidase

(2009) *Journal of Applied Sciences Research*, 5 (7), pp. 905-913.

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^b Molecular Biology Department, National Research Centre, Cairo, Egypt

^c Biochemistry Division, Chemistry Department, Faculty of Science, Fayoum University, Fayoum, Egypt

Abstract

Leucine aminopeptidase, LAP2, was purified from *Fasciola gigantica*. LAP2 was purified by DEAE-Sepharose and Sephacryl S-200 column chromatographies. The relative molecular mass of *F. gigantica* LAP2 was estimated to be 30 kDa by gel filtration on Sephacryl S-200 column and electrophoresis on SDS-polyacrylamide gel. The Km value of *F. gigantica* LAP2 was estimated to be 0.13 mM L-leucine β -naphthylamine as substrate. The relative hydrolysis rates of amino acid-naphthylamines were highest with L-leucine β -naphthylamine (100%) and moderate with L-lysine β -naphthylamine (62%) and L-arginine β -naphthylamine (45%). The enzyme showed high activity in the pH range 7.5-9.0, with optimum activity in Tris-HCl buffer at pH 8.0. *F. gigantica* LAP2 had maximal activity at 30°C and was stable up to 40°C. The effects of various standard protease inhibitors against the *F. gigantica* LAP2 were demonstrated. Sulphahydryl reagent, PCMB, and serine protease inhibitor, PMSF, had no effect on the enzyme activity. *F. gigantica* LAP2 was inhibited by 1,10-o-phenanthroline, EDTA, sodium oxalate and sodium citrate indicating that the enzyme is metalloaminopeptidase. Except for Fe³⁺ which had no effect on *F. gigantica* LAP2, all metal cations tested inhibited the enzyme activity. © 2009, INSInet Publication.

Author Keywords

Fasciola gigantica; Leucine aminopeptidase; Properties; Protease inhibitors; Purification

Mohamed, S.A.^{a, b}, Al-Malki, A.L.^a, Kumosani, T.A.^a

Partial purification and characterization of five α -amylases from a wheat local variety (Balady) during germination

(2009) *Australian Journal of Basic and Applied Sciences*, 3 (3), pp. 1740-1748. Cited 1 time.

^a Biochemistry Department, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia

^b Molecular Biology Department, National Research Centre, Cairo, Egypt

Abstract

A local Saudi Arabian wheat (*Triticum aestivum*) variety (Balady) showed high levels of amylolytic activities at different stages of germination. The activity of α -amylase increased from day 0 to day 6 of germination, where it exhibited its highest level (2300 units/g seeds), followed by decrease of activity till day 16. Chromatography of 6 days old wheat seedlings of germination on DEAE-Sepharose column showed five forms of α -amylase activities (α -amylases AI, AII, AIII, AIV and AV). The apparent Km values of isoenzymes for hydrolyzing starch were 1.42 mg, 2.0 mg, 1.1 mg, 2.5 mg and 1.7 mg, respectively. α -amylases AI, AII, AIII, AIV and AV were found to have sharp and broad pH optima of 5.5, 5.5-6.5, 5.0-6.0, 5.0-6.0 and 7.0, respectively. The temperature optima of wheat amylases are the same at 50°C. Thermal stability study showed that α -amylases AI, AIV and AV were stable up to 50°C after incubation for 15 min, while α -amylases AII and AIII were stable up to 40°C. The affinity between substrate and enzyme was detected only for glycogen and starch compared with other carbohydrates tested, where glycogen had more affinity than starch. Various metal ions such as Ca²⁺, Zn²⁺, Ni²⁺, Hg²⁺, Zn, Ni, Hg and Cd²⁺ at 2 mM were tested for amylase activation/inhibition effect. Ca²⁺ is found to have activating effect as indicated by increased activity for all isoenzymes except of AII which is inhibited. In conclusion, these α -amylases from wheat have interesting characteristics such as low km value, broad pH optimum, high optimum temperature, high affinity toward starch and glycogen and activation by some metal as calcium. Therefore, these characterization meet the prerequisites need for food industry. © 2009, INSInet Publication.

Author Keywords

α -amylase; Characterization; Germination; *Triticum aestivum*; Wheat

Asiri, A.M.^a, Bahajaj, A.A.^b, Al-Sehemi, A.G.^c, Alsoliemy, A.M.^a

Photochromic properties of 1,3,3-trimethylspiro[indoline-2,3'-[3H]naphtho[2,1-b][1,4]oxazine] doped in PMMA and epoxy resin thin films

(2009) *Arabian Journal of Chemistry*, 2 (1), pp. 13-17.

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Abstract

Irradiation of colorless 1,3,3-trimethylspiro[indoline-2,3'-[3H]naphtho[2,1-b][1,4]oxazine] SO doped in PMMA and epoxy resin with UV light (at 366 nm) results in the formation of an intensely colored zwitterionic photomerocyanine PMC. The reverse reaction was photochemically induced by irradiation with white light. Photocoloration and photobleaching reactions follow a first-order rate equation. It was found that photocoloration rate constant of SO in PMMA film is greater than that in epoxy resin. On the other hand, the photobleaching rate constant is almost identical in both matrices. Spirooxazine doped in epoxy resin shows much better fatigue resistance than that doped in PMMA. © 2009 King Saud University.

Author Keywords

Epoxy resin; Fatigue resistance; Kinetics; Photobleaching; Photochromism; Photocoloration; Polymer film; Spirooxazine

Zegeye, H.^a, Shahzad, N.^b

Strong convergence theorems for a common zero of a countably infinite family of α -inverse strongly accretive mappings

(2009) *Nonlinear Analysis, Theory, Methods and Applications*, 71 (1-2), pp. 531-538.

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Abstract

Let E be a real reflexive Banach space which has a uniformly Gâteaux differentiable norm. Assume that every nonempty closed convex and bounded subset of E has the fixed point property for nonexpansive mappings. Strong convergence theorems for approximation of a common zero of a countably infinite family of α -inverse strongly accretive mappings are proved. Related results deal with strong convergence of theorems to a common fixed point of a countably infinite family of strictly pseudocontractive mappings. © 2008 Elsevier Ltd. All rights reserved.

Author Keywords

α -inverse strongly accretive mappings; Nonexpansive mappings; Normalized duality mappings; Strictly convex spaces; Strictly pseudocontractive mappings; Uniformly Gâteaux differentiable norm

Zegeye, H.^a, Shahzad, N.^b

Strong convergence theorems for continuous semigroups of asymptotically nonexpansive mappings

(2009) *Numerical Functional Analysis and Optimization*, 30 (7-8), pp. 833-848.

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^b Department of Mathematics, King Abdul Aziz University, P.O.B. 80203, Jeddah 21589, Saudi Arabia

Abstract

Let K be a nonempty closed convex and bounded subset of a real Banach space E . Let $T \mathfrak{S} := \{T(t) : t \in \mathbb{R}^+\}$ be a strongly continuous semigroup of asymptotically nonexpansive self-mappings on K with a sequence $\{t_n\} \subset [1, \infty)$. Then, for a given $\mu_0 \in K$ and $s_n \in (0, 1)$, $t_n \geq 0$ there exists a sequence $\{u_n\} \subset K$ such that $u_n = (1-s_n)T(t_n)u_n + s_n\mu_0$, for each $n \in \mathbb{N}$; satisfying $\|u_n - T(t)u_n\| \rightarrow 0$ as $n \rightarrow \infty$, for any $t > 0$, where μ_0 is a fixed point of T . If, in addition, E is uniformly convex with uniformly Gâteaux differentiable norm, then it is proved that $F(\mathfrak{S}) \neq \emptyset$ and the sequence $\{u_n\}$ converges strongly to a point of $F(\mathfrak{S})$ under certain mild conditions on $\{t_n\}$, $\{s_n\}$ and $\{\mu_0\}$. Moreover, it is proved that an explicit sequence $\{x_n\}$ generated from $x_1 \in K$ by $x_{n+1} = s_n\mu_0 + (1-s_n)T(t_n)x_n$, $n \geq 1$, converges to a fixed point of T under appropriate assumption imposed upon the sequence $\{x_n\}$.

Author Keywords

Asymptotically nonexpansive mappings; Fixed points; Nonexpansive mappings; Strongly continuous semigroups of asymptotically nonexpansive mappings; Strongly continuous semigroups of nonexpansive mappings

Samarkandy, A.R.^a, Mostafa, K.M.^b

Synthesis and development of novel aminated chelating resin and its application in industrial waste water treatment

(2009) *Australian Journal of Basic and Applied Sciences*, 3 (3), pp. 1772-1779.

^a King Abdul Aziz University, Faculty of Science, Chemistry Department, Saudi Arabia

^b National Institute for Standards (NIS), Textile Department, El-Haram, El-Giza, Egypt

Abstract

An investigation was undertaken regarding the adsorption of different heavy metal ions from aqueous solutions using novel tertiary aminated cellulose (TAC) having different amine extents, which was prepared by reacting amine epoxide formed from epichlorohydrin and various amounts of diethyl amine with cellulose pulp as a starting substrate. This was done to obtain three levels of TAC having different amination extent (expressed as % N) with increasing order and designated as (TAC I, TAC II and TAC III). The different factors affecting metal ions adsorption on this substrate such as metal ion concentration, pH, treatment time and temperature as well as extent of amination were studied in detail. It was found from the obtained results that; the adsorption % increased with (a) increasing the metal ions concentration up to 50 mmol/l then levels off, (b) increasing the pH value within the studied range, (c) increasing the treatment time up to 2 hour then levels off, (d) increasing the extent of amination reaction within the range studied, and (e) decreasing the temperatures from 80°C to 60°C and then to 0°C respectively. Furthermore, tertiary aminated cellulose was selective adsorbent for Hg²⁺ at pH 0.5, and the adsorption % of different metal ions on it follows the order: Hg²⁺ > Cu > Zn > Ni²⁺ > Co²⁺ > Cd²⁺ > Pb²⁺. On the other hand, durability of tertiary aminated cellulose derivatives was also examined. © 2009, INSInet Publication.

Author Keywords

Adsorption; Durability; Epichlorohydrin; Heavy metal ions; Nitrogen %; Tertiary aminated cellulose

El-Sebaei, A.A., Al-Ghamdi, A.A., Al-Hazmi, F.S., Faidah, A.S.

Thermal performance of a single basin solar still with PCM as a storage medium

(2009) *Applied Energy*, 86 (7-8), pp. 1187-1195. Cited 5 times.

Physics Department, Science College, King Abdul Aziz University, P.O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

Transient mathematical models are presented for a single slope-single basin solar still with and without phase change material (PCM) under the basin liner of the still. Analytical expressions for temperatures of the still elements and the PCM have been obtained. The still performance has been investigated by computer simulation. Numerical calculations have been carried out, using stearic acid as a PCM, on typical summer and winter days in Jeddah (lat. 21° 42' N, long. 39° 11' E), Saudi Arabia. Effect of mass of the PCM (mpcm) on the daylight Pdl, overnight Pon and daily productivity Pd and efficiency ηd of the still for different masses of basin water mw has been investigated. It is found that Pdl decreases as mpcm increases; but Pon and Pd increase significantly with an increase of mpcm due to the increased amount of the heat stored within the PCM. During discharging of the PCM, the convective heat transfer coefficient from the basin liner to basin water is doubled; thus, the evaporative heat transfer coefficient is increased by 27% on using 3.3 cm of stearic acid beneath the basin liner. Therefore, on a summer day, a value of Pd of 9.005 (kg/m² day) with a daily efficiency of 85.3% has been obtained compared to 4.998 (kg/m² day) when the still is used without the PCM. The PCM is more effective for lower masses of basin water on winter season. © 2008 Elsevier Ltd. All rights reserved.

Author Keywords

Heat transfer coefficients; Phase change material; Productivity; Single basin solar still; Solar stills

Asiri, A.M.^a, Akkurt, M.^b, Zayed, M.A.M.^a, Khan, I.U.^c, Arshad, M.N.^c

2-[(E)-2,5-Dimethoxy-benzyl-idene]indan-1-one

(2009) *Acta Crystallographica Section E: Structure Reports Online*, 65 (5), pp. o1061.

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^c Department of Chemistry, Government College University, Lahore, Pakistan

Abstract

In the title compound, C₁₈H₁₆O₃, the mean plane of the nine-membered indane system makes a dihedral angle of 3.71 (17)° with the benzene ring of the dimethoxy-phenyl group. The mol-ecular conformation is stabilized by intra-molecular C - H...O hydrogen contacts. The crystal structure is stabilized by inter-molecular C - H...O inter-actions, which link neighbouring mol-ecules into one-dimensional extended chains along the [100] direction. In the structure, C - H...n inter-actions are also observed.

Gabal, M.A., Al Angari, Y.M.

Effect of diamagnetic substitution on the structural, magnetic and electrical properties of NiFe₂O₄
(2009) *Materials Chemistry and Physics*, 115 (2-3), pp. 578-584.

Chemistry department, Faculty of Science, King Abdul Aziz university, Jeddah, Saudi Arabia

Abstract

Nickel zinc ferrites, Ni_{1-x}Zn_xFe₂O₄ (0.0 ≤ x ≤ 1.0) have been prepared through the thermal decomposition reaction of their corresponding metal oxalates. The samples were characterized using differential thermal analysis-thermogravimetry, X-ray diffraction, Fourier transform infrared, Mössbauer spectroscopy and electrical properties measurement techniques. The X-ray diffraction patterns confirm the single-phase spinel structure for the synthesized materials. The average crystallite size was found to be ranging from 88 to 201 nm. The lattice parameters were found to increase with increasing zinc content which can be attributed to the larger ionic radius of zinc. The FT-IR measurements show two fundamental absorption bands in the high- and low-frequency range which are assigned to the vibration of tetrahedral and octahedral complexes. The highest ν₁-tetrahedral stretching shifts towards lower values with increasing Zn content, whereas the ν₂-octahedral vibration slightly changed. The cation distribution estimated using Mössbauer spectroscopy indicated that Fe³⁺ ions at the tetrahedral site moved to the octahedral site by the addition of zinc, and that the system varied from an inverse to a normal spinel structure. The temperature variation of ac conductivity for the samples with x ≤ 0.4 shows a ferrimagnetic-paramagnetic transition. The calculated activation energy in the paramagnetic region was found to be higher than that in the ferrimagnetic region. Plots of dielectric constant (ε') versus temperature show a normal dielectric behavior of spinel ferrites and exhibit dielectric transition temperatures (T_d) which coincide with the obtained phase transition temperatures (T_c), indicating that this transition is of a magnetic nature. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

ac Conductivity; Dielectric constant; FT-IR; Mössbauer; Nickel-zinc ferrites; XRD

Asiri, A.M.^a, Akkurt, M.^b, Khan, S.A.^a, Khan, I.U.^c, Arshad, M.N.^c

Ethyl (Z)-2-cyano-3-(9-ethyl-9H-carbazol-3-yl)prop-2-enoate
(2009) *Acta Crystallographica Section E: Structure Reports Online*, 65 (5), pp. o1169.

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^b Department of Physics, Faculty of Arts and Sciences, Erciyes University, 38039 Kayseri, Turkey

^c Department of Chemistry, Government College University, Lahore, Pakistan

Abstract

In the title compound, C₂₀H₁₈N₂O₂, weak inter-molecular C - H...O and C - H...N inter-actions generate a chain that runs parallel to the b axis and incorporates C(7) and R²₂^{²(15) graph-set motifs. The supra-molecular aggregation is completed by the presence of weak C - H...n inter-actions.}

Latif, A., Kutbi, M.A.

Fixed points for w-contractive multimaps

(2009) *International Journal of Mathematics and Mathematical Sciences*, 2009, art. no. 769467, .

Department of Mathematics, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

Using the generalized Caristi's fixed point theorems we prove the existence of fixed points for self and nonself multivalued weakly w-contractive maps. Consequently, Our results either improve or generalize the corresponding fixed point results due to Latif (2007), Bae (2003), Suzuki, and Takahashi (1996) and others.

Latif, A.

Generalized caristi's fixed point theorems

(2009) *Fixed Point Theory and Applications*, 2009, art. no. 170140, .

Department of Mathematics, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

We present generalized versions of Caristi's fixed point theorem for multivalued maps. Our results either improve or generalize the corresponding generalized Caristi's fixed point theorems due to Bae (2003), Suzuki (2005), Khamsi (2008), and others.

Shahzad, N.

Invariant approximations in CAT(0) spaces

(2009) *Nonlinear Analysis, Theory, Methods and Applications*, 70 (12), pp. 4338-4340. Cited 2 times.

Department of Mathematics, King Abdul Aziz University, P.O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

Some common fixed point and invariant approximation results for CAT(0) spaces are obtained. Our results improve and extend some results of Shahzad and Markin [N. Shahzad, J. Markin, Invariant approximation for commuting mappings in hyperconvex and CAT(0) spaces, *J. Math. Anal. Appl.* 337 (2008) 1457-1464] and Dhompongsa, Kaewkhao, and Panyanak [S. Dhompongsa, A. Kaewkhao, B. Panyanak, Lim's theorem for multivalued mappings in CAT(0) spaces, *J. Math. Anal. Appl.* 312 (2005) 478-487]. © 2008 Elsevier Ltd. All rights reserved.

Author Keywords

CAT(0) space; Invariant approximation; Nonexpansive mapping

El-Mossalamy, E.H.

Potentiometric and spectroscopic studies of sulfonamide azo-dye complexes with some transition metal ions and uranium

(2009) *Portugaliae Electrochimica Acta*, 27 (2), pp. 143-152.

Chemistry Department, Faculty of Science, King Abdul Aziz University, Jeddah, Saudi Arabia

Abstract

Molecular structure of the azo-dye derived from sulfonamide was synthesized. The elucidation of ligand and complex structures were studied by electronic, infrared and ¹H NMR spectroscopies. Proton-ligand constants of sulphonamid azo-derivatives and the stability constant of Mo (III), VO (II), UO₂ (II) and Co (II) metal ions with sulfonamide azodye derivatives have been determined potentiometrically in 0.1 M KCl and 30% (v/v) ethanol-water mixture. The data are discussed in terms of the electronic character of the substituents and of the change in temperature. The pK^{>1-H} values have been found to increase with increasing electron donating nature of the substituents. The evaluated dissociation processes are non spontaneous, endothermic and entropically unfavourable. The order of the stability constants of the formed complexes was found to be Mo^{>3+}>VO^{>2+}>UO₂^{>2+}>Co^{>2+}. The influence of substituents on the stability of the complexes was examined on the basis of an electron repelling property of the substituent. The effect of temperature on the stability of the formed complexes was studied and the corresponding thermodynamic parameters (ΔG, ΔH and ΔS) were evaluated and discussed. The stoichiometries of these complexes were determined conductometrically and indicated the formation of 1:1 and 1:2 (metal:ligand) complexes.

Author Keywords

Complexation and Thermodynamics; Conductometric; Potentiometric; Sulfonamide azo-dyes

Wazzan, L.

A modified tanh-coth method for solving the general Burgers-Fisher and the Kuramoto-Sivashinsky equations

(2009) *Communications in Nonlinear Science and Numerical Simulation*, 14 (6), pp. 2642-2652. Cited 2 times.

Department of Mathematics, King Abdulaziz University, P.O. Box 80263, Jeddah, 21589, Saudi Arabia

Abstract

In this work we use a modified tanh-coth method to solve the general Burgers-Fisher and the Kuramoto-Sivashinsky equations. The main idea is to take full advantage of the Riccati equation that the tanh-function satisfies. New multiple travelling wave solutions are obtained for the general Burgers-Fisher and the Kuramoto-Sivashinsky equations. © 2008 Elsevier B.V. All rights reserved.

Author Keywords

General Burgers-Fisher equation; Kuramoto-Sivashinsky equation; Riccati equation; The extended tanh method; The tanh-coth method; Travelling wave solutions

Shah, M.A.

A versatile bottom up approach for the synthesis of tin oxide nanoparticles and their potential
(2009) *International Journal of Nanoscience*, 8 (3), pp. 289-292.

Department of Physics, Faculty of Sciences, King Abdul Aziz University, Jeddah 21589, Saudi Arabia

Abstract

Functional oxides are presently much investigated for their potential applications in various areas and Tin oxide appears particularly interesting when grown in nanometer range. A versatile and an economic technique have been developed for the synthesis of tin oxide nanoparticles, which does not require any substrate or surfactant. The technique is based on a simple reaction of tin and water at low temperature. The water is regarded as benign and safe solvent and the nanostructures so produced are biocompatible. This synthetic technique has the following advantages: First, the synthesis needs no sophisticated equipments since it is conducted at low temperature of 200°C under normal atmosphere. Second, the clean surfaces of the as-synthesized nanostructures can be readily functionalized for various applications since there is neither a capping reagent nor a substrate. Finally, the approach is nontoxic without producing hazardous waste. Therefore, the technique could be extended and expanded to provide a general simple and convenient strategy for the synthesis of nanostructures of other functional materials with important scientific and technological applications. The relative studies are in process and will be reported in forth coming publications. © 2009 World Scientific Publishing Company.

Author Keywords

Hydrogen evolution reaction; Nanostructures; Simple synthesis; Tin powder

Al-Roqi, A.

Finite soluble group generated by the conjugacy class of an involution
(2009) *Communications in Algebra*, 37 (6), pp. 2040-2051.

Department of Mathematics, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

Let G be a finite group and P a subgroup of order 2. We study in this article the structures of the soluble subgroup of G that is generated by three conjugates of P . We use the results we proved about the soluble subgroups that are generated by three conjugates of P to find a soluble analogue of the Baer-Suzuki Theorem in the case prime 2. © Taylor & Francis Group, LLC.

Author Keywords

Soluble groups

Al-Ghamdi, A.A.^a, El-Tantawy, F.^b, Abdel Aal, N.^c, El-Mossalamy, E.H.^d, Mahmoud, W.E.^{a, b}

Stability of new electrostatic discharge protection and electromagnetic wave shielding effectiveness from poly(vinyl chloride)/graphite/nickel nanoconducting composites
(2009) *Polymer Degradation and Stability*, 94 (6), pp. 980-986.

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Abstract

Poly(vinyl Chloride)/graphite nanosheet/nickel (PVC/GN) nanocomposites are new alternative candidates for electrostatic charge dissipation and electromagnetic interference shielding applications due to their lightweight, ease processing and tunable conductivities. The structures of the nanocomposites were examined by means of scanning electron microscopy (SEM) and X-ray analysis. The mechanical properties such as hardness, modulus of elasticity and elongation at break as a function of GN content were examined. The applicability of the nanocomposites as electrostatic charge dissipation was tested in terms of displaying the variation of decay voltage with time. In addition, the dielectric properties such as real and imaginary permittivity of composites as functions of frequency were investigated. Finally, the electromagnetic properties were measured in the frequency range from 1 to 12 GHz and compared with theoretical modeling. The highest shielding effectiveness at microwave frequency of these nanocomposites was 47 dB which is realistic for defense applications like radar evasion. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

Conducting graphite - nickel nanocomposites; Dielectric properties; Electromagnetic shielding; Electrostatic discharge protection; Microstructure

Meziani, L.

Tightness of probability measures on function spaces

(2009) *Journal of Mathematical Analysis and Applications*, 354 (1), pp. 202-206.

Department of Mathematics, Faculty of Science, King Abdulaziz University, PO Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

Let $CE = C([0, 1], E)$ be the Banach space, with the supremum norm, of all continuous functions f from the unit interval $[0, 1]$ into the Banach space E . If $E = \mathbb{R}$ we put $CR = C$. Function spaces under consideration are equipped with their Borel σ -field. This paper deals with the tightness property of some classes of probability measures (p.m) on the function space CE . We will be concerned mainly with the specific cases $E = \mathbb{R}$, $E = \mathbb{C}$ and more generally E a separable Banach space. We give sufficient conditions for tightness by extending and strengthening the conditions developed by Prohorov in connection with limit theorems of stochastic processes. In the general case of a separable Banach space E , the property of tightness will be settled under conditions of different nature from those of Prohorov. Finally weak convergence of p.m on CE will be established under the condition of weak convergence of their finite dimensional distributions. This extends a similar result valid in the space C . © 2008 Elsevier Inc. All rights reserved.

Author Keywords

Relative compactness; Tightness of probability measures; Weak convergence

Al-Thagafi, M.A., Shahzad, N.

Convergence and existence results for best proximity points

(2009) *Nonlinear Analysis, Theory, Methods and Applications*, 70 (10), pp. 3665-3671.

Department of Mathematics, King AbdulAziz University, P.O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

We provide a positive answer to a question raised by Eldred and Veeramani [A.A. Eldred, P. Veeramani, Existence and convergence of best proximity points, *J. Math. Anal. Appl.* 323 (2006) 1001-1006] about the existence of a best proximity point for a cyclic contraction map in a reflexive Banach space. Moreover, we introduce a new class of maps, called cyclic ϕ -contractions, which contains the cyclic contraction maps as a subclass. Convergence and existence results of best proximity points for cyclic ϕ -contraction maps are also obtained. © 2008 Elsevier Ltd. All rights reserved.

Author Keywords

Banach space; Best proximity point; Cyclic ϕ -contraction map; Fixed point; Metric space

Tantawy, S.F., Hariri, A.M.A.

An $O((m+n) \max\{m+n, n^{\sup>3\sup>}\})$ procedure for solving the linear programming problem

(2009) *Journal of Applied Sciences Research*, 5 (4), pp. 329-333.

Department of Statistics, Faculty of Science, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

An iterative method based on conjugate gradient projection method (and not on any variant of Karmarkars algorithm) for solving linear programming problems is given. Our method consists of a sequence of moves: Starting with an initial interior point $x^{\sup>0\sup>}$ our procedure finds a second feasible point $x^{\sup>1\sup>}$ then a third point and so on until the optimal point is reached in at most $m+n$ steps. A simple example is given to illustrate our method. © 2009, INSInet Publication.

Author Keywords

Linear program-conjugate gradient Projection

Khan, S.A., Al-Hazmi, F.S., Faidah, A.S., Al-Ghamdi, A.A.

Calorimetric studies of the crystallization process in a-Se75S25-xAgx chalcogenide glasses

(2009) *Current Applied Physics*, 9 (3), pp. 567-572. Cited 1 time.

Department of Physics, Faculty of Science, King Abdul Aziz University, Post Box No. 80203, Jeddah 21589, Saudi Arabia

Abstract

Calorimetric studies of amorphous Se₇₅S₂₅-xAg_x (x = 2, 4, 6 and 8) chalcogenide glasses are made at different heating rates (5, 10, 15 and 20 K/min) under non-isothermal condition using Differential scanning calorimetry. The values of glass transition temperature and crystallization temperature are observed to be composition and heating rate dependence. From the heating rate dependence of glass transition temperature and crystallization temperature, the activation energy for structural relaxation (ΔE_t), the activation energy of crystallization (ΔE_c) and the order parameter (n) have been calculated. It is observed that Se₇₅S₁₉Ag₆ has a minimum value of activation energy for structural relaxation (ΔE_t), which indicates that this particular glass has a larger probability to jump to a state of lower configurational energy and higher stability in the glassy region. On the basis of the obtained experimental data the temperature difference ($T_c - T_g$) is found to be maximum for Se₇₅S₁₉Ag₆, which further indicate that this glass is the thermally most stable in the entire composition range of investigation. © 2008 Elsevier B.V. All rights reserved.

Author Keywords

Activation energy; Amorphous semiconductor; Crystallization kinetics; Glasses

Khan, S.A., Al-Hazmi, F.S., Al-Sanosi, A.M., Faidah, A.S., Yaghmour, S.J., Al-Ghamdi, A.A.

Effect of Ag incorporation on electrical and optical properties of Se-S chalcogenide thin films

(2009) *Physica B: Condensed Matter*, 404 (8-11), pp. 1415-1419. Cited 2 times.

Department of Physics, Faculty of Science, King Abdul Aziz University, Jeddah, 21589, Saudi Arabia

Abstract

The dc electrical conductivity of as evaporated thin films of Se₇₅S₂₅-xAg_x, grown by vacuum evaporation technique is measured as a function of temperature (294-383 K). It is observed that the dc conductivity decreases at all the temperatures with the increase of silver content in the binary system. The experimental data suggests that the conduction is due to thermally assisted tunneling of the carriers in the localized states near the band edges. The extracted value of activation energy is found to increase on incorporation of silver contents in the Se-S system. Compositional dependence of the optical properties of as deposited Se₇₅S₂₅-xAg_x thin films of thickness 300 nm have also been studied in the spectral range from 400 to 1000 nm. It has been found that the optical band gap increases on incorporation of silver contents in Se-S system. The values of absorption coefficient (α) and extinction coefficient (k) increases with increasing photon energy and silver concentration. The results are interpreted in terms of the change in concentration of localized states due to the shift in Fermi level. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Absorption coefficient; Activation energy optical band gap; Chalcogenide glasses; dc Conductivity; Thin films

Al-Hazmi, F.S.

Effect of annealing on optical constants of Se₇₅S₂₅-xCd_x chalcogenide thin films

(2009) *Physica B: Condensed Matter*, 404 (8-11), pp. 1354-1358. Cited 1 time.

Department of Physics, Faculty of Science, King Abdul Aziz University, Post Box No. 80203, Jeddah 21589, Saudi Arabia

Abstract

The optical band gap and optical constants of as deposited and annealed thin films with thickness 3000 Å prepared by thermal evaporation technique of Se₇₅S₂₅-xCd_x (where x=0, 2, and 4) chalcogenide glasses have been investigated as a function of photon energy in the wavelength region 400-1000 nm. Thin films were thermally annealed for one hour at three different temperatures chosen from the region in between their glass transition and crystallization temperatures. The glass transition and crystallization temperatures were measured by using non-isothermal DSC measurements. The absorption coefficient and optical band gap was found to increase with the increase in annealing temperatures, while the values of refractive index (n) and the extinction coefficient (k) decreases with the increase in annealing temperature. dc Conductivity measurements on thin films of Se₇₅S₂₅-xCd_x are also reported in the temperature range 303-375 K. It has been observed that the conduction is due to thermally assisted tunneling of the carriers in the localized states near the band edges. The dc conductivity and activation energy were observed to increase on adding cadmium concentration in the present system. © 2009 Elsevier B.V. All rights reserved.

Author Keywords

Absorption coefficient; Activation energy; Annealing; Chalcogenide glasses; dc Conductivity; Optical band gap

El-Nahass, M.M.^a, Faidah, A.S.^b

Electrical characterizations of SnPc/p-GaAs heterojunction

(2009) *EPJ Applied Physics*, 46 (2), art. no. 20401, .

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^b Physics Department, Faculty of Science, King Abdul Aziz University, Jeddah, Saudi Arabia

Abstract

Current voltage and capacitance-voltage characteristics for SnPc thin film with ~105 nm thickness; deposited on p-GaAs single crystals have been investigated. The dark current voltage-characteristics of the prepared junction have been investigated in a temperature range from ~303 to 393 K. The obtained results showed rectification behaviour. At low forward and reverse bias, the current was found to be limited by the thermoionic emission, while at high forward voltage, space charge limited current dominated by a single trap level of 0.22 eV. The analysis of the dark capacitance voltage characteristics indicated that the carrier concentration is $1.4 \times 10^{14} \text{ cm}^{-3}$ with a built in voltage ~0.55 eV. © EDP Sciences.

Elshal, M.F.^{a c}, El-Sayed, I.H.^a, Elsaied, M.A.^b, El-Masry, S.A.^a, Kumosani, T.A.^c

Sperm head defects and disturbances in spermatozoal chromatin and DNA integrities in idiopathic infertile subjects: Association with cigarette smoking

(2009) *Clinical Biochemistry*, 42 (7-8), pp. 589-594.

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Abstract

Objectives: To evaluate sperm chromatin and DNA integrities in idiopathic infertile men and determine the possible association(s) of cigarette smoking on oxidative stress markers, antioxidant capacity and semen quality. **Subjects and methods:** Semen samples from men referring to the andrology laboratory were categorized into 3 groups: fertile non-smokers (n = 16), infertile non-smokers (n = 36), and infertile smokers (n = 34). Semen analysis was performed according to WHO criteria. The percentage of sperm DNA fragmentation index (%DFI) and the percentage of sperm with abnormally high DNA stainability (HDS%; immature spermatozoa) were determined by SCSA using the metachromatic properties of acridine orange. Lipid peroxidation, superoxide dismutase (SOD), catalase (CAT) and reduced glutathione (GSH) levels in seminal plasma and spermatozoa were measured by spectrophotometric assays. **Results:** The classical semen parameters were negatively correlated with lipid peroxidation in spermatozoa; motility and morphology were negatively correlated with %DFI (p < 0.05). HDS% was also negatively correlated with above markers except for morphology (r = - 0.352, p = 0.081). DFI% and HDS% were significantly higher in the infertile smokers group than in infertile non-smokers (p = 0.032; p = 0.001 respectively). Cigarette smoking was significantly associated with DFI%, HDS%, TBARS and the fraction of "round-headed" sperm (r = 0.796, p = 0.0001; r = 0.371, p = 0.033; r = 0.606, r = 0.591, p = 0.001 respectively), and decreased SOD levels (r = - 0.545). **Conclusion:** DFI%, HDS% and round-head sperms are increased in idiopathic infertile men; this increase is associated with cigarette smoking. These defects may be attributed to increased oxidative stress and insufficient scavenging antioxidant enzymes in the seminal fluid of infertile patients. © 2008 The Canadian Society of Clinical Chemists.

Author Keywords

Antioxidants; DFI; DNA; Flow cytometry; Free radicals; HDS; Male infertility; Oxidative stress; Smoking; Spermatozoa

Rostom, S.A.F.^{a c}, Ashour, H.M.A.^b, Abd El Razik, H.A.^b

Synthesis and biological evaluation of some novel polysubstituted pyrimidine derivatives as potential antimicrobial and anticancer agents

(2009) *Archiv der Pharmazie*, 342 (5), pp. 299-310.

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Abstract

Synthesis and evaluation of the antimicrobial and cytotoxic activity of two series of polysubstituted pyrimidines comprising the thioether functionality and other pharmacophores, reported to contribute to various chemotherapeutic activities are described. All newly synthesized compounds were subjected to in-vitro antibacterial and antifungal screening. Out of the compounds tested, 18 derivatives displayed an obvious inhibitory effect on the growth of the tested Gram-positive and Gram-negative bacterial strains, with special effectiveness against the Gram-positive strains. Compounds 1, 2, 6, 7, 9, 10, 11, 21, and 24 revealed remarkable broad antibacterial spectrum profiles. Among those, compounds 1, 2, 6, 7, 9, and 24 exhibited an appreciable antifungal activity against *C. albicans*. Compound 2 proved to be the most active antimicrobial member identified here as it showed twice the activity of ampicillin against *B. subtilis* and the same activity of ampicillin against *M. luteus* and *P. aeruginosa* together with a moderate antifungal

activity. Further, eleven analogs were evaluated for their in-vitro cytotoxic potential utilizing the standard MTT assay against a panel of three human cell lines: breast adenocarcinoma MCF7, hepatocellular carcinoma HePG2, and colon carcinoma HT29. The obtained data revealed that six of the tested compounds 1, 3, 7, 12, 13, and 15 showed a variable degree of cytotoxic activity against the tested cell lines at both the LC50 and LC90 levels. Compound 7 proved to be the most active cytotoxic member in this study with special effectiveness against the colon carcinoma HT29 and breast cancer MCF7 human cell lines for LC50 and LC90. Thus, compounds 1 and 7 could be considered as possible dual antimicrobial-anticancer agents. © 2009 Wiley-VCH Verlag GmbH & Co. KGaA.

Author Keywords

Antibacterial; Anticancer activity; Antifungal; Pyrimidines; Thioether

Badran, R.I.^a, Al-Heniti, S.^a, Al-Hazmi, F.S.^a, Al-Ghamdi, A.A.^a, Li, J.^b, Xiong, S.^b

The influence of change in silane concentration and substrate temperature on optical properties of hydrogenated microcrystalline silicon films

(2009) *Journal of Optoelectronics and Advanced Materials*, 11 (5), pp. 635-643.

^a Physics Department, King Abdulaziz University, P.O. Box 80203, Jeddah, Saudi Arabia

^b Institute of Optoelectronics, Nankai University, Tianjin, 300071, China

Abstract

The influence of change in deposition conditions of silane concentration and substrate temperature on optical properties of hydrogenated microcrystalline silicon thin film samples prepared by Plasma Enhanced Chemical Vapor Deposition (PECVD) technique, are investigated. The crystalline volume fraction for the samples determined from Raman spectra are correlated with the silane concentration, substrate temperature, deposition rate, absorption coefficient, refractive index and optical energy gap. In addition, a decrease in crystalline volume fraction is found accompanied by a decrease in both dark and photo- conductivities. The values of optical parameters (refractive index and absorption coefficient) are calculated from the transmission spectra in the range 400-2500nm and then used to determine optical band energy gap and Urbach energy. All these values are fairly compared to those obtained by different techniques.

Author Keywords

A-Si: H and μ -Si:H; Electrical conductivity; Infrared and Raman spectra; Optical properties; PECVD

Shah, M.A.^{a, b}, Asiri, A.M.^{a, b}

Synthesis and characterization of α -Fe₂O₃ nanorods by a simple reaction of iron and water

(2009) *International Journal of Modern Physics B*, 23 (10), pp. 2323-2327.

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^b Department of Chemistry, Faculty of Science, King Abdul Aziz University, P.O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

A soft approach has been described for the formation of α -Fe₂O₃ nanorods by simple reaction of iron with water at a very low temperature range of 100-300°C. It is shown that the nanorods have diameters ranging from 50 - 80 nm, and their typical lengths are in the range of 5 - 10 μ m. The chemical composition and crystalline structure of nanorods were investigated by various characterization techniques. The initial formation and subsequent growth of α -Fe₂O₃ nanostructures may be explained by the iron metal corrosion mechanism. © 2009 World Scientific Publishing Company.

Author Keywords

Corrosion; Iron powder; Nanomaterials; Synthesis

Ahmad, B.^a, Nieto, J.J.^b

Existence results for nonlinear boundary value problems of fractional integrodifferential equations with integral boundary conditions

(2009) *Boundary Value Problems*, 2009, art. no. 708576, . Cited 11 times.

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^b Departamento de Análisis Matemático, Facultad de Matemáticas, Universidad de Santiago de Compostela, 15782 Santiago de Compostela, Spain

Abstract

This paper deals with some existence results for a boundary value problem involving a nonlinear integrodifferential equation of fractional order $q \in (1, 2]$ with integral boundary conditions. Our results are based on contraction mapping principle and Krasnosel'ski's fixed point theorem.

Latif, A.^a, Abdou, A.A.N.^b

Fixed points of generalized contractive maps

(2009) *Fixed Point Theory and Applications*, 2009, art. no. 487161, .

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^b Girls College of Education, King Abdulaziz University, P.O. Box 55002, Jeddah, Saudi Arabia

Abstract

We prove some results on the existence of fixed points for multivalued generalized w-contractive maps not involving the extended Hausdorff metric. Consequently, several known fixed point results are either generalized or improved.

Badahdaha, K.O.^a, Asiri, A.M.^a, Ng, S.W.^b

2-(1,3-Benzothiazol-2-ylimino-methyl)-2-naphthol

(2009) *Acta Crystallographica Section E: Structure Reports Online*, 65 (4), pp. o759.

^a Chemistry Department, Faculty of Science, King Abdul Aziz University, Jeddah, Saudi Arabia

^b Department of Chemistry, University of Malaya, 50603 Kuala Lumpur, Malaysia

Abstract

In the title molecule, C₁₈H₁₂N₂O₂S, the dihedral angle between the two fused-ring systems is 7.2 (1)°. The hydroxy group forms an intra-molecular hydrogen bond with the imino group. © 2009.

Asiri, A.M.^a, Akkurt, M.^b, Khan, I.U.^c, Arshad, M.N.^a

4-(2-Methoxybenzylidene)-2-phenyl-1,3-oxazol-5(4H)-one

(2009) *Acta Crystallographica Section E: Structure Reports Online*, 65 (4), pp. o842.

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^b Department of Physics, Faculty of Arts and Sciences, Erziyes University, 38039 Kayseri, Turkey

^c Department of Chemistry, Government College University, Lahore, Pakistan

Abstract

The title molecule, C₁₇H₁₃N₃O₃, adopts a Z configuration about the central olefinic bond. The 2-phenyl ring is almost coplanar with the plane of the oxazolone ring system, making a dihedral angle of 2.03 (11)°. The crystal structure is stabilized by n-n inter-actions between the oxazolone ring and phenyl ring of a neighbouring molecule [centroid-centroid distance = 3.550 (3) Å], and by two weak inter-molecular C - H...N inter-actions. In addition, the crystal structure exhibits one weak intra-molecular C - H...N hydrogen bond.

Asiri, A.M.^a, Ng, S.W.^b

Diethyl 3H-naphtho[2,1-b]pyran-2,3-dicarboxylate

(2009) *Acta Crystallographica Section E: Structure Reports Online*, 65 (4), pp. o760.

^a Chemistry Department, Faculty of Science, King Abdul Aziz University, Jeddah, Saudi Arabia

^b Department of Chemistry, University of Malaya, 50603 Kuala Lumpur, Malaysia

Abstract

The sp³-hybridized methine C atom in the title compound, C₁₉H₁₈O₅, lies out of the mean plane of the remaining 13 atoms of the naphthopyran fused-ring system by 0.571 (1) Å, and its H atom occupies a pseudo-equatorial site. © 2009.

Asiri, A.M.^a, Ng, S.W.^b

(E,E)-2-[3,4-Bis(4-methyl-benzylidene)-5-oxotetrahydrofuran-2-ylidene] propane-dinitrile

(2009) *Acta Crystallographica Section E: Structure Reports Online*, 65 (4), pp. o761.

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^b Department of Chemistry, University of Malaya, 50603 Kuala Lumpur, Malaysia

Abstract

In the title molecule, C₂₃H₁₆N₂O₂, the two exocyclic C=C bonds bearing the tolyl groups have an E configuration and the benzene rings are oriented at 22.1 (1) and 24.8 (1)° with respect to the mean plane of the atoms of the furan ring. © 2009.

Batarfi, H.A.^a, Al-Khayat, I.A.^b, Sebawe Abdalla, M.^c, Hassan, S.S.^b

Spectra of the jaynes-cummings model in presence of a second harmonic generation

(2009) *International Journal of Modern Physics B*, 23 (9), pp. 2215-2232.

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^b Mathematics Department, College of Science, Bahrain University, P.O. Box 32038, Bahrain

^c Mathematics Department, College of Science, King Saud University, P.O. Box 2455, Riyadh 11451, Saudi Arabia

Abstract

Dipole and cavity field transient spectra are investigated for a modified Jaynes-Cummings (JC) model due to the presence of a second harmonic generation (SHG) cavity field. For initially de-excited atom and field in a coherent state, detuning effects due to SHG affects the symmetry and splitting structure of both spectra. © 2009 World Scientific Publishing Company.

Author Keywords

Fluorescent and transmitted spectra; Modified JC Model; SHG

Ahmad, F.^a, Al-Barakati, W.H.^b

An approximate analytic solution of the Blasius problem

(2009) *Communications in Nonlinear Science and Numerical Simulation*, 14 (4), pp. 1021-1024. Cited 3 times.

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Abstract

The [4/3] Pade approximant for the derivative is modified so that the resulting expression has the required asymptotic behavior. This gives an analytical result which represents the solution of the classical Blasius problem on the whole domain. © 2008 Elsevier B.V. All rights reserved.

Author Keywords

Analytical solution; Blasius problem; Pade approximation; Viscous flow

Ćirić, L.^a, Hussain, N.^b, Akbar, F.^c, Ume, J.S.^d

Common fixed points for Banach operator pairs from the set of best approximations

(2009) *Bulletin of the Belgian Mathematical Society - Simon Stevin*, 16 (2), pp. 319-336. Cited 1 time.

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^c Department of Mathematics, University of Sargodha, Sargodha, Pakistan

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Abstract

The existence of common fixed point results for a Banach operator pair under certain generalized ϕ -contractions is established. As applications, the corresponding invariant best approximation results are proved. Our results unify and generalize various known results to the more general class of non-commuting mappings.

Author Keywords

ϕ -contraction; Banach operator pair; Ćirić; Common fixed point; Compatible maps; Invariant approximation

Bokhari, F.M.

Efficacy of some Trichoderma species in the control of Rotylenchulus reniformis and Meloidogyne javanica

(2009) *Archives of Phytopathology and Plant Protection*, 42 (4), pp. 361-369.

Biological Science Department, Faculty of Science, King Abdulaziz University, Saudi Arabia

Abstract

The environmental pollutions are one of the major problems in the world and the decrease of Agro-Chemicals pollutions like chemical nutrition and hormones and pesticides are very important for human health and environmental balances. Utilizing of certain biocontrol agents against plant pests are one of our targets in decreasing environmental

pollutions. The efficacy of *Trichoderma* species in control of reniform nematode (*Rotylenchulus reniformis*) and root-knot nematode (*Meloidogyne javanica*) were studied invitro and under greenhouse conditions. The effect of *Trichoderma harazianum*, *T. viride*, *T. koningii*, *T. reesei* and *T. hamatum* culture filtrate in controlling reniform nematode and root-knot nematode was studied invitro in 14cm Petri-dish during one week exposure and under greenhouse conditions on one month eggplant cv black beauty seedlings in 12cm plastic pots containing 1kg sandy loam (1:1 V/V) soil. All culture filtrate of the *Trichoderma* species was highly significant in controlling both nematode genera on eggplant. *Trichoderma harazianum*, *T. hamatum* and *T. koningii* culture filtrates gave a significant reduction ($p \leq 0.01$) invitro and decreased the female and egg-masses of reniform and root-knot nematodes. *Trichoderma* species led to inhibition of the nematode activity and movements invitro during one week exposure. *Trichoderma* culture filtrate was more significant on root-knot nematode (*Meloidogyne javanica*) egg than on larvae. It can be summarized that the role of *Trichoderma* controls both nematode genera by a direct effect on toxic metabolites and inhibits nematode penetration and developments.

Author Keywords

Biocontrol; Nematodes; *T. harazianum*; *T. koningii*; *T. reesei*; *T. viride*; *Trichoderma*

Sabir, J.S.M.^a, El-Bestawy, E.^b

Enhancement of nodulation by some arid climate strains of *Rhizobium leguminosarum* biovar *trifolii* using protoplast fusion

(2009) *World Journal of Microbiology and Biotechnology*, 25 (4), pp. 545-552.

^a Department of Biological Sciences, Faculty of Science, King Abdulaziz University, P. O. Box 80141, Jeddah 21589, Saudi Arabia

^b Department of Environmental Studies, Institute of Graduate Studies and Research, Alexandria University, 163 Horria Ave, El-Shatby, Alexandria 21526, Egypt

Abstract

Fourteen randomly clover indigenous nodulated *Rhizobium* strains were isolated from different locations in Saudi Arabia. They were identified as different strains of the genus *Rhizobium leguminosarum* biovar *trifolii* and characterized for their intrinsic antibiotic resistance against a range of antibiotics, nodulation capability and plasmid profiles. Results revealed the presence of high molecular weight plasmids (megaplasmids) in all the selected strains. Based on the ability for nodulation production, two weak strains (RtI1 and RtI2) and one efficient strain (RtA1) were selected for protoplast fusion and the numbers of nodules produced by the intra-specific protoplast fusion strains were investigated. Results clearly confirmed the effective role of the protoplast fusion in enhancing both nodulation production capacity of *Rhizobium* species and their range of antibiotic resistance. Protoplast fusion of the local *Rhizobium* species resulted in 1.93- to 5.67-fold increase in nodulation number compared to their parental strains, which was considered an excellent result concerning agricultural practices, especially the formation of nitrogen-fixing root nodules on legume crop plants. Protoplast fusion also produced fusants with a wide range of antibiotic resistance, another advantage added to the new strains against environmental stresses. In conclusion, protoplast fusion proved its efficiency as a tool for constructing a second generation of *Rhizobia* with much better characteristics for efficient applications in arid land. © 2008 Springer Science+Business Media B.V.

Author Keywords

Antibiotic resistance; Clover; Curing; Genes; Nodulation; Plasmids; Protoplast fusion; *Rhizobium*; Root nodulating bacteria

Pathak, H.K.^a, Shahzad, N.^b

Fixed point results for set-valued contractions by altering distances in complete metric spaces

(2009) *Nonlinear Analysis, Theory, Methods and Applications*, 70 (7), pp. 2634-2641.

^a School of Studies in Mathematics, Pt. Ravishankar Shukla University, Raipur (G.C.), 492010, India

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Abstract

Nadler's contraction principle has led to fixed point theory of set-valued contraction in non-linear analysis. Inspired by the results of Nadler, the fixed point theory of set-valued contraction has been further developed in different directions by many authors, in particular, by Reich, Mizoguchi-Takahashi, Feng-Liu and many others. In the present paper, the concept of generalized contractions for set-valued maps in metric spaces is introduced and the existence of fixed point for such a contraction are guaranteed by certain conditions. Our first result extends and generalizes the Nadler, Feng-Liu and Klim-Wardowski theorems and the second result is different from the Reich and Mizoguchi-Takahashi results. As a consequence, we derive some results related to fixed point of set-valued maps satisfying certain conditions of integral type. © 2008 Elsevier Ltd. All rights reserved.

Author Keywords

Complete metric space; Hausdorff metric; Set-valued contraction

Pathak, H.K.^a, Shahzad, N.^b

Gregus type fixed point results for tangential mappings satisfying contractive conditions of integral type*
(2009) *Bulletin of the Belgian Mathematical Society - Simon Stevin*, 16 (2), pp. 277-288.

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Abstract

The notion of pair-wise tangential mappings, which is a generalization of mappings satisfying (E.A) property, is introduced and used to prove a common fixed point theorem of Gregus type for a quadruple of self mappings of a metric space satisfying a strict general contractive condition of integral type. Our main result generalizes a recent result of A. Djoudi, A. Alioche [Common fixed point theorems of Gregus type for weakly compatible mappings satisfying contractive conditions of integral type, *J. Math. Anal. Appl.* 329 (2007), 31-45].

Author Keywords

Coincidence points; Common fixed points; Common property (E.A); Pair-wise tangential property; Property (E.A); Weakly compatible mappings

Malik, M.A.^a, AL-Thabaiti, S.A.^b, Khan, Z.^{a b}

Kinetics of oxidation of d-glucose by permanganate in aqueous solution of cetyltrimethylammonium bromide

(2009) *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 337 (1-3), pp. 9-14. Cited 1 time.

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Abstract

The catalytic effect of cetyltrimethylammonium bromide (CTAB) on the permanganate oxidation of d-glucose has been studied spectrophotometrically in presence of sulphuric acid. It was observed that the reaction proceeds in two stages (a slow step followed by a relatively fast second step). The influence of different parameters was measured i.e., [reactants], [surfactant], [sulphuric acid] and temperature. The absorbance of the reaction mixture increases with [CTAB] which suggests the association of permanganate with the cationic head group of CTAB. The effect of [surfactant] on the rate constants was explained in terms of the pseudo phase model proposed by Menger and Portnoy and modified by Bunton et al. On the basis of observed kinetic results, a suitable mechanism has been proposed. © 2008 Elsevier B.V. All rights reserved.

Author Keywords

CTAB; d-Glucose; Micellar catalysis; Oxidation; Permanganate

Zenkour, A.M.

Stress distribution in rotating composite structures of functionally graded solid disks

(2009) *Journal of Materials Processing Technology*, 209 (7), pp. 3511-3517. Cited 1 time.

Department of Mathematics, Faculty of Science, King AbdulAziz University, PO Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

In this article, two composite structures of functionally graded material (FGM) solid disks are considered. The composite structures are composed of three-layer sandwich solid disks with faces made of different isotropic materials and core made of FGM. For Structure 1, the inner layer is metal and the outer layer is ceramic while the core layer is a metal-ceramic FGM. Structure 2 is composed of the same constituent materials as in Structure 1 but interchanging the metal material with the ceramic one. An accurate elastic solution for the rotating structures is given according to the boundary condition at the outer surface of the disk. Numerical results for displacement and stresses at the interfaces of the composite structure disks are presented. Additional distributions of stresses and displacement through the radial direction of the rotating structures are plotted. The effect due to many parameters on the stresses and displacement is investigated. © 2008 Elsevier B.V. All rights reserved.

Author Keywords

Functionally graded material; Rotating; Three-layer sandwich disks

Zegeye, H.^a, Shahzad, N.^b

Strong convergence theorems for monotone mappings and relatively weak nonexpansive mappings
(2009) *Nonlinear Analysis, Theory, Methods and Applications*, 70 (7), pp. 2707-2716. Cited 1 time.

^a Bahir Dar University, P.O. Box. 859, Bahir Dar, Ethiopia

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Abstract

In this paper, we prove strong convergence theorems to a zero of monotone mapping and a fixed point of relatively weak nonexpansive mapping. Moreover, strong convergence theorems to a point which is a fixed point of relatively weak nonexpansive mapping and a solution of a certain variational problem are proved under appropriate conditions.
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Author Keywords

γ -inverse strongly monotone mappings; Generalized projection; Monotone mappings; Strong convergence; Strongly monotone mappings; variational inequality problems

Meziani, L.

On the dual space $C^{*0}(S, X)$

(2009) *Acta Mathematica Universitatis Comeniana*, 78 (1), pp. 153-160.

Department of Mathematics, Faculty of Science King Abdulaziz University, P.O Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

Let S be a locally compact Hausdorff space and let us consider the space $C_0(S, X)$ of continuous functions vanishing at infinity, from S into the Banach space X . A theorem of I. Singer, settled for S compact, states that the topological dual $C^{*0}(S, X)$ is isometrically isomorphic to the Banach space $\text{robv}(S, X)$ of all regular vector measures of bounded variation on S with values in the strong dual X^{*} . Using the Riesz-Kakutani theorem and some routine topological arguments, we propose a constructive detailed proof which is, as far as we know, different from that supplied elsewhere.

Author Keywords

Bounded functionals' vector measures; Vector-Valued functions

Al-Thagafi, M., Shahzad, N.

A note on occasionally weakly compatible maps

(2009) *International Journal of Mathematical Analysis*, 3 (2), pp. 55-58.

Department of Mathematics, King Abdul Aziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

We communicate some important remarks about the concept of occasionally weakly compatible (owc) maps which was introduced by Al-Thagafi and Shahzad [1]. This concept is recently becoming a topic of considerable research interest; see, e.g., [2, 3, 4, 7].

Author Keywords

Metric space; Occasionally weakly compatible map; Weakly compatible map

Badran, R.I.^a, Al-Hazmi, F.S.^a, Al-Heniti, S.^a, Al-Ghamdi, A.A.^a, Li, J.^b, Xiong, S.^b

A study of optical properties of hydrogenated microcrystalline silicon films prepared by plasma enhanced chemical vapor deposition technique at different conditions of excited power and pressure

(2009) *Vacuum*, 83 (7), pp. 1023-1030. Cited 2 times.

^a Physics Department, King Abdulaziz University, P.O. Box, 80203 Jeddah, Saudi Arabia

^b Institute of Optoelectronics, Nankai University, Tianjin, 300071, China

Abstract

Two sets of hydrogenated microcrystalline silicon thin-film samples were prepared by Plasma Enhanced Chemical Vapor Deposition (PECVD) technique at different deposition conditions of excited power and pressure. The correlation between the crystalline volume fraction for the samples determined from Raman spectra and the excited power, pressure, absorption coefficient, refractive index and optical energy gap was discussed. The values of optical parameters (refractive index and absorption coefficient), were calculated from the transmission spectra in the range 400-2500 nm. The optical band energy gap and Urbach energy were obtained using the calculated values of absorption coefficients. © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

a-Si:H; Electrical conductivity; Infrared and Raman spectra; Optical properties; Plasma enhanced chemical vapor deposition

Rostom, S.A.F.^a, Ashour, H.M.A.^b, Razik, H.A.A.E.^b, Fattah, A.E.F.H.A.E.^c, El-Din, N.N.^d

Azole antimicrobial pharmacophore-based tetrazoles: Synthesis and biological evaluation as potential antimicrobial and anticonvulsant agents

(2009) *Bioorganic and Medicinal Chemistry*, 17 (6), pp. 2410-2422. Cited 1 time.

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^c Department of Microbiology, High Institute of Public Health, Alexandria University, Alexandria, Egypt

^d Department of Pharmacology, Faculty of Medicine, Alexandria University, Alexandria, 21521, Egypt

Abstract

The azole pharmacophore is still considered a viable lead structure for the synthesis of more efficacious and broad spectrum antimicrobial agents. Potential antibacterial and antifungal activities are encountered with some tetrazoles. Therefore, this study presents the synthesis and antimicrobial evaluation of a new series of substituted tetrazoles that are structurally related to the famous antimicrobial azole pharmacophore. A detailed discussion of the structural elucidation of some of the newly synthesized compounds is also described. Antimicrobial evaluation revealed that twenty compounds were able to display variable growth inhibitory effects on the tested Gram positive and Gram negative bacteria with special efficacy against the Gram positive strains. Meanwhile, six compounds exhibited moderate antifungal activity against *Candida albicans* and *Aspergillus fumigatus*. Structurally, the antibacterial activity was encountered with tetrazoles containing a phenyl substituent, while the obtained antifungal activity was confined to the benzyl variants. Compounds 16, 18, 24 and 27 were proved to be the most active antibacterial members within this study with a considerable broad spectrum against all the Gram positive and negative strains tested. A distinctive anti-Gram positive activity was displayed by compound 18 against *Staphylococcus aureus* that was equipotent to ampicillin (MIC 6.25 µg/mL). On the other hand, twelve compounds were selected to be screened for their preliminary anticonvulsant activity against subcutaneous metrazole (ScMet) and maximal electroshock (MES) induced seizures in mice. The results revealed that five compounds namely; 3, 5, 13, 21, and 24 were able to display noticeable anticonvulsant activity in both tests at 100 mg/kg dose level. Compounds 5 and 21 were proved to be the most active anticonvulsant members in this study with special high activity in the ScMet assay (% protection: 100% and 80%, respectively). © 2009 Elsevier Ltd. All rights reserved.

Author Keywords

1,3,4-Oxadiazoles; 1,3,4-Triazoles; 1H-Tetrazoles; Antibacterial activity; Anticonvulsant activity; Antifungal activity; Azoles; Pyrazoles

Markin, J.^a, Shahzad, N.^b

Best approximation theorems for nonexpansive and condensing mappings in hyperconvex spaces

(2009) *Nonlinear Analysis, Theory, Methods and Applications*, 70 (6), pp. 2435-2441. Cited 1 time.

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Abstract

In hyperconvex metric spaces we consider best approximation, invariant approximation and best proximity pair problems for multivalued mappings that are condensing or nonexpansive. © 2008 Elsevier Ltd. All rights reserved.

Author Keywords

Best approximations; Best proximity pairs; Condensing mappings; Hyperconvex spaces; Invariant sets; Nonexpansive mappings

Salah, N.^a, Habib, S.S.^a, Khan, Z.H.^a, Al-Hamed, S.^b, Lochab, S.P.^c

Nanoparticles of BaSO₄:Eu for heavy-dose measurements

(2009) *Journal of Luminescence*, 129 (3), pp. 192-196. Cited 2 times.

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Abstract

Nanoparticles of BaSO₄:Eu with grain size in the range 30-50 nm have been prepared by the chemical co-precipitation method and characterized by UV-visible spectrometry and X-ray diffraction (XRD). Shape and size of the prepared nanomaterials were observed by a scanning electron microscope (SEM). The optical energy band gaps of the micro- and nanocrystalline BaSO₄:Eu were determined and are found to be 3.39±0.0136 and 3.48±0.0139 eV, respectively. The thermoluminescence (TL) glow curve of BaSO₄:Eu nanoparticles has been studied and compared with that of the corresponding microcrystalline powder. It has been observed that the TL glow peak at 497 K, seen prominently in the microcrystalline sample, appeared as a small peak in nanocrystalline powder, while that observed as a shoulder in the former at 462 K dominates in the latter. The observed TL sensitivity of the prepared nanocrystalline powder is less than that of the microcrystalline sample at low doses, while it is more at higher doses. This nanophosphor exhibits a linear/sublinear TL response to γ -radiation over a very wide range of exposures (0.1 Gy to 7 KGy), which is much wider compared to that of the microcrystalline counterpart (0.1-10 Gy). This response over a large span of exposures makes the nanostructure form of BaSO₄:Eu useful for its application to estimate low as well as high exposures of γ -rays. © 2008 Elsevier B.V. All rights reserved.

Author Keywords

Band gap; BaSO₄:Eu; Nanoparticles; SEM; Thermoluminescence

Farid, E.-T.^a, Aal, N.A.^b, Al-Ghamdi, A.A.^c, EI-Mossaiamy, E.H.^c

New smart conducting elastomer blends of bi-based superconductor ceramics nanoparticles reinforced natural rubber/low-density polyethylene for double thermistors, antistatic protectors, and electromagnetic interference shielding effectiveness applications

(2009) *Polymer Engineering and Science*, 49 (3), pp. 592-601.

^a Department of Physics, Faculty of Science, Suez Canal University Ismailia, Egypt

^b Chemistry Department, Faculty of Science, Suez Canal University Ismailia, Egypt

^c Department of Physics, Faculty of Science, King Abdulaziz University, Jeddah 80203, Jeddah 21569, Saudi Arabia

Abstract

A new conducting blend from natural rubber (NR), lowdensity polyethylene (PE), and Bi-based superconductor (BSCCO) nanoparticles was successfully formulated. Blends were prepared by means of an open two-roll mill for five ratios (100/0, 90/10, 80/20, 70/30, and 60/40 NR/LDPE). The microstructures of the blends were examined in terms of scanning electron microscopy (SEM), bound rubber (BR), cross-linking density (CLD), and Mooney viscosity (ftf-i oo). The mechanical properties like hardness (H) shore A, tensile strength (TS), and elongation at break (EB) of the blends were studied. The applicability of the blends as double thermistors, i.e., positive and negative coefficient of resistivity (PTCR/NTCR), was examined. The applicability of the blend for antistatic charge dissipation was also tested. Finally, electromagnetic interference response of conducting NR/PE-filled BSCCO in the frequency range 1-12 GHz has been studied. Shielding effectiveness of the conducting blends in the microwave range 8-12 GHz shows an attenuation of 44-60 dB for PE <10 wt%. IPOLYM. ENG. SCI., 49:592-601, 2009. © 2009 Society of Plastics Engineers.

Ismail, M.S.^{a b}

Numerical solution of a coupled Korteweg-de Vries equations by collocation method

(2009) *Numerical Methods for Partial Differential Equations*, 25 (2), pp. 275-291.

^a Department of Mathematics, College of Science, King Abdulaziz University, Jeddah 21589, Saudi Arabia

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Abstract

A numerical method for solving the coupled Korteweg-de Vries (CKdV) equation based on the collocation method with quintic B-spline finite elements is set up to simulate the solution of CKdV equation. Invariants and error norms are studied wherever possible to determine the conservation properties of the algorithm. Simulation of single soliton, interaction of two solitons, and birth of solitons are presented. A linear stability analysis shows the scheme to be unconditionally stable. © 2008 Wiley Periodicals, Inc.

Author Keywords

Birth of solitons; CKdV equation; Collocation method; Quintic B-splines; Soliton interaction

Ismail, M.S.

Numerical solution of complex modified Korteweg-de Vries equation by collocation method

(2009) *Communications in Nonlinear Science and Numerical Simulation*, 14 (3), pp. 749-759. Cited 1 time.

Department of Mathematics, College of Science, King Abdulaziz University, P.O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

The collocation method using quintic B-spline is derived for solving the complex modified Korteweg-de Vries (CMKdV). The method is based on Crank-Nicolson formulation for time integration and quintic B-spline functions for space integration. The von Neumann stability is used to prove that the scheme is unconditionally stable. Newton's method is used to solve the nonlinear block pentadiagonal system obtained. Numerical tests for single, two, and three solitons are used to assess the performance of the proposed scheme. © 2007 Elsevier B.V. All rights reserved.

Author Keywords

CMKdV equation; Collocation method; Quintic B-splines; Solitons interaction

Seddik, A.

On the injective norm and characterization of some subclasses of normal operators by inequalities or equalities

(2009) *Journal of Mathematical Analysis and Applications*, 351 (1), pp. 277-284. Cited 1 time.

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Abstract

Let $B(H)$ be the C^* -algebra of all bounded linear operators acting on a complex Hilbert space H . In this note, we shall show that if S is an invertible normal operator in $B(H)$ the following estimation holds $\|S \otimes S^{-1} + S^{-1} \otimes S\|_{\lambda} \leq \|S\| \|S^{-1}\| \left(\|S\| \|S^{-1}\| + \frac{1}{\|S\| \|S^{-1}\|} \right)$ where $\|\cdot\|_{\lambda}$ is the injective norm on the tensor product $B(H) \otimes B(H)$. This last inequality becomes an equality when S is invertible self-adjoint. On the other hand, we shall characterize the set of all invertible normal operators S in $B(H)$ satisfying the relation $\|S \otimes S^{-1} + S^{-1} \otimes S\|_{\lambda} = \|S\| \|S^{-1}\| \left(\|S\| \|S^{-1}\| + \frac{1}{\|S\| \|S^{-1}\|} \right)$ and also we shall give some characterizations of some subclasses of normal operators in $B(H)$ by inequalities or equalities. © 2008 Elsevier Inc. All rights reserved.

Author Keywords

Injective norm; Normal operator; Self-adjoint operator; Tensor product space; Unitary operator

Shahzad, N.

Fixed point results for multimaps in CAT(0) spaces

(2009) *Topology and its Applications*, 156 (5), pp. 997-1001. Cited 1 time.

Department of Mathematics, King Abdul Aziz University, P.O.B. 80203, Jeddah, 21589, Saudi Arabia

Abstract

Common fixed point results for families of single-valued nonexpansive or quasi-nonexpansive mappings and multivalued upper semicontinuous, almost lower semicontinuous or nonexpansive mappings are proved either in CAT(0) spaces or R-trees. It is also shown that the fixed point set of quasi-nonexpansive self-mapping of a nonempty closed convex subset of a CAT(0) space is always nonempty closed and convex. © 2008 Elsevier B.V. All rights reserved.

Author Keywords

Almost lower semicontinuous; CAT(0) spaces; Fixed point; Nonexpansive mapping; R-tree; Upper semicontinuous

Mostafa, Kh.M.^a, Samarkandy, A.R.^b, El-Sanabary, A.A.^c

Using persulfate oxidized chitosan as a novel additives in easy-care finishing for cotton textiles

(2009) *Polymer - Plastics Technology and Engineering*, 48 (2), pp. 130-135.

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^b Faculty of Science, Chemistry Department, King Abdul Aziz University, Jeddah, Saudi Arabia

^c Polymers and Pigments Department, National Research Center (NRC), Dokki, Cairo, Egypt

Abstract

Easy care finishing of cotton fabric using glyoxal in the presence and absence of low molecular weight chitosan, i.e., persulfate-oxidized chitosan, as a novel additive along with $MgCl_2 \cdot 6H_2O$ as an acid catalyst was studied in detail. Major factors affecting finishing reaction were studied with respect to glyoxal, oxidized chitosan, and catalyst concentrations in addition to curing time and temperature of treatment according to the pad-dry-cure method. The obtained results show the following findings: (a) increasing the glyoxal concentration from 5-50 g/l in absence of oxidized chitosan is accompanied by an increase in crease recovery angle and a decrease in tensile strength of the finished fabric, whereas that treated in the presence of oxidized chitosan shows a higher tensile strength and to some extent comparable crease recovery angle with respect to that finished in the absence of it when the concentration of glyoxal increases; (b) increasing the oxidized chitosan concentration is accompanied by decreasing crease recovery angle, whereas the tensile strength increases when glyoxal concentration increases within the range studied; (c) increasing the $MgCl_2 \cdot 6H_2O$ from 0-15 g/l is accompanied by an increase in the crease recovery angle and a decrease in tensile strength of the finished fabrics in the presence and absence of oxidized chitosan; (d) increasing the time and temperature of curing of the finished fabrics is accompanied by an increase in crease recovery angles and decreases in tensile strength; and (e) the dry wrinkle recovery angle of cotton fabric samples finished in presence of O-chitosan is decreased after washing, and the higher the washing cycle the lower the dry wrinkle recovery angle.

Author Keywords

Acid catalyst; DMDHEU; Durability; Oxidized chitosan; Tensile strength; Wrinkle recovery angle

Alvi, M.A., Arafah, M.R., Madani, J.H., Ahmad, I.

Microscopic study of neutron elastic scattering from C12, Ca40, and Pb208 at intermediate energies

(2009) *Physical Review C - Nuclear Physics*, 79 (2), art. no. 024604, .

Department of Physics, Faculty of Science, King Abdulaziz University, Jeddah-21589, Saudi Arabia

Abstract

Recent neutron elastic scattering differential cross section data for C12, Ca40, and Pb208 at several energies from 65 to 225 MeV have been analyzed using Glauber multiple scattering model, suitably modified to enlarge angular range of validity. The center of mass and Pauli pair correlations have been considered. The effect of the phase variation of the NN scattering amplitude on the calculated cross sections has been studied. A medium modification of the elementary NN interaction is also considered. The neutron differential cross sections have been calculated using the phenomenological and the recently proposed semiphenomenological neutron and proton target densities so as to check the validity of the semiphenomenological density model. We found that our method of analysis gives a very good description of the experimental data. © 2009 The American Physical Society.

Wazzan, L.

A modified tanh-coth method for solving the KdV and the KdV-Burgers' equations

(2009) *Communications in Nonlinear Science and Numerical Simulation*, 14 (2), pp. 443-450. Cited 1 time.

Department of Mathematics, King Abdulaziz University, P.O. Box 80263, Jeddah, 21589, Saudi Arabia

Abstract

In this work we use a modified tanh-coth method to solve the Korteweg-de Vries and Korteweg-de Vries-Burgers' equations. The main idea is to take full advantage of the Riccati equation that the tanh-function satisfies. New multiple travelling wave solutions are obtained for the Korteweg-de Vries and Korteweg-de Vries-Burgers' equations. © 2007 Elsevier B.V. All rights reserved.

Author Keywords

KdV equation; KdV-Burgers' equation; Riccati equation; The extended tanh method; The tanh-coth method; Travelling wave solutions

Al-Thagafi, M.A., Shahzad, N.

Best proximity pairs and equilibrium pairs for Kakutani multimaps

(2009) *Nonlinear Analysis, Theory, Methods and Applications*, 70 (3), pp. 1209-1216. Cited 3 times.

Department of Mathematics, King AbdulAziz University, P.O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

New existence theorems of best proximity pairs for a finite family of Kakutani multimaps are proved in a normed space setting. As applications, new existence theorems of equilibrium pairs for free n-person and 1-person games are obtained. Our results generalize and improve several well-known results. © 2008 Elsevier Ltd. All rights reserved.

Author Keywords

Best proximity pair; Equilibrium pair; Fixed point; Free n-person game; Kakutani multimap

Ahmad, B., Alsaedi, A.

Existence of approximate solutions of the forced Duffing equation with discontinuous type integral boundary conditions

(2009) *Nonlinear Analysis: Real World Applications*, 10 (1), pp. 358-367. Cited 3 times.

Department of Mathematics, Faculty of Science, King Abdulaziz University, P.O. Box. 80203, Jeddah, 21589, Saudi Arabia

Abstract

We develop a generalized quasilinearization technique to obtain a sequence of approximate solutions converging monotonically and quadratically to the unique solution of the forced Duffing equation with discontinuous type integral boundary conditions. © 2007 Elsevier Ltd. All rights reserved.

Author Keywords

Duffing equation; Integral boundary conditions; Quadratic convergence; Quasilinearization

Malik, M.A.^a, Ilyas, M.^a, Khan, Z.^{a b}

Kinetics of permanganate oxidation of synthetic macromolecule poly(vinyl alcohol)

(2009) *Indian Journal of Chemistry - Section A Inorganic, Physical, Theoretical and Analytical Chemistry*, 48 (2), pp. 189-193.

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Abstract

Oxidation of poly(vinyl alcohol) (PVA) by permanganate has been studied spectrophotometrically at 525 and 420nm. Under pseudo-first order conditions ($[PVA] \gg [MnO_4^-]$), the reaction rate increases with $[PVA]$ and the kinetics reveals complex order dependences $[PVA]$. The second-order kinetics with respect to $[H_2SO_4]$ at low concentration shifts to first-order at higher concentration. Water soluble colloidal MnO_2 has been identified as an intermediate in the reduction of MnO_4^- by PVA. The hydrogen ions decrease the stability of colloidal MnO_2 . Poly(vinyl ketone) is found to be the final oxidation product of PVA. Inorganic electrolytes like NaF, $Na_4P_2O_7$ and $MnCl_2$ (a product of the reaction), have inhibitory and composite effects (inhibition and catalysis) on the reaction rate. Arrhenius and Eyring equations have been used to evaluate the activation parameters. The observed results are discussed in terms of Michaelis-Menten kinetic model. A mechanism has been proposed on the basis of experimental findings.

Author Keywords

Kinetics; Oxidations; Permanganate oxidations; Poly(vinyl alcohol); Reaction mechanisms

Al-Hazmi, F.S.

Optical changes induced by laser-irradiation on thin films Of Se75S15Ag10 Chalcogenide

(2009) *Chalcogenide Letters*, 6 (2), pp. 63-69.

Department of Physics, Faculty of Science, King Abdul Aziz University, Jeddah 21589, Saudi Arabia

Abstract

Chalcogenide thin films of Se75S15Ag10 have been prepared by using thermal evaporation technique with thickness of 3000 Å. Optical constants (absorption coefficient, optical band gap, refractive index and extinction coefficient) of as evaporated and laser irradiated thin films of Se75S15Ag10 has been studied as a function of photon energy in the wavelength region 400-900 nm. Analysis of the optical absorption data shows that the rule of indirect transitions predominates. It has been found that the absorption coefficient and optical band gap increases with increasing time of laser-irradiation. This change in the optical band gap may be due to the increase in the grain size and the reduction in the disorder of the system. The values of refractive index and extinction coefficient decrease by increasing time of laser-irradiation. The results are interpreted in terms of the change in concentration of localized states due to the shift in Fermi level.

Author Keywords

Absorption coefficient; Chalcogenide glasses; Laser-irradiation; Optical band gap; Thin films

Asiri, A.M., Rasul, M.G.

Synthesis of (2E)-2-(2,4,6-trimethoxybenzylidene)indan-1-one
(2009) *MolBank*, 2009 (1), .

Chemistry Department, Faculty of Science, King Abdul Aziz University, P.O. Box 80203, Jeddah 21413, Saudi Arabia

Author Keywords

1-Indanone; Conjugated chromophores; Nonlinear optics

Ayyad, S.-E.N.^a, Bahaffi, S.O.S.^a, Hashish, N.E.^b

Isolation and structure determination of the biologically active sphingolipids from marine sponge Haliclona species
(2009) *Natural Product Research*, 23 (1), pp. 44-50.

^a Faculty of Science, Department of Chemistry, King Abdulaziz University, Jeddah, Saudi Arabia

^b Faculty of Pharmacy, Department of Pharmacy, Mansoura University, Mansoura, Egypt

Abstract

In a continuation to our study on the marine sponge Haliclona species we have isolated three new cytotoxic components of sphingolipids (1-3). Methanolysis of the sphingolipid 1a-d in methanol produces fatty acid methyl ester. GC/MS was used to determine the length. The structure of each isolated compound has been determined on the basis of spectroscopic data and chemical evidence.

Author Keywords

¹H, ¹³C NMR; Cytotoxicity; GC-MS; Haliclona sponge; Sphingolipids

Ahmad, B.

Existence of solutions for second-order nonlinear impulsive boundary-value problems
(2009) *Electronic Journal of Differential Equations*, 2009, pp. 1-7.

Department of Mathematics, Faculty of Science, King Abdulaziz University, P.O. Box. 80203, Jeddah 21589, Saudi Arabia

Abstract

We prove the existence of solutions for a second-order nonlinear impulsive boundary-value problem by applying Schaefer's fixed point theorem. Results for periodic and anti-periodic impulsive boundary-value problems can be obtained as special cases of the results in this article. © 2009 Texas State University - San Marcos.

Ahmad, B.

Approximation of solutions of the forced duffing equation with m-point boundary conditions
(2009) *Communications in Applied Analysis*, 13 (1), pp. 11-20. Cited 1 time.

Department of Mathematics, Faculty of Science, King Abdulaziz University, P.O. Box. 80203, Jeddah 21589, Saudi Arabia

Abstract

In this paper, we discuss the existence and uniqueness of the solution of the forced Duffing equation with m-point boundary conditions. A monotone sequence of approximate solutions converging uniformly and quadratically to the unique solution of the problem is obtained by applying a generalized quasilinearization technique © Dynamic Publishers, Inc.

Kabli, S.A.

Effect of some bioagents on growth and toxin production of Aspergillus flavus Link
(2009) *Journal of Food, Agriculture and Environment*, 7 (1), pp. 219-223.

Department of Biological Sciences, Faculty of Science, King Abdulaziz University, P.O. Box: 80203, Jeddah, Saudi Arabia

Abstract

The extracts of *Aspergillus niger*, *Lactobacillus lactis* and *Nigella sativa* seeds as aflatoxin and growth inhibitors of *Aspergillus flavus* were screened. Minimal inhibitory (MIC) and minimal fungicidal (MFC) concentrations of the extracts were determined. *N. sativa* seeds extract showed a higher inhibitory effect than the other two bioagents extracts. The results show that *N. sativa* extract inhibits growth and aflatoxin production, which may be due to a reduction in lipid biosynthesis in the toxin producing cultures. The correlation between versicolorin A accumulation and aflatoxin biosynthesis by *A. flavus* Link was also discussed. It could be of significant importance as bio-preservatives in the prevention and control of aflatoxin production.

Author Keywords

Aflatoxin inhibitors; *Aspergillus flavus*; Bioagents; Versicolorin A

Ahmad, B.^a, Sivasundaram, S.^b

Existence and uniqueness results for nonlinear boundary value problems of fractional differential equations with separated boundary conditions

(2009) *Communications in Applied Analysis*, 13 (1), pp. 121-128. Cited 3 times.

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^b Department of Mathematics, Embry-Riddle Aeronautical University, Daytona Beach, FL 32114, United States

Abstract

Nonlinear fractional differential equations, separated boundary conditions, existence, This paper studies existence and uniqueness results in a Banach space for a two-point boundary value problem involving a nonlinear fractional differential equation given by (equation is presented) $cD_{\alpha}x(t) = f(t, x(t))$, $0 < t < 1$, $1 < \alpha < 2$, $ax(0) + (3x'(0) = 71$, $ax(1) + /3x'(1) = 72$ -Our results are based on contraction mapping principle and Krasnoselskii's fixed point theorem. © Dynamic Publishers, Inc.

Lazăr, T.A.^a, Petrușel, A.^b, Shahzad, N.^c

Fixed points for non-self operators and domain invariance theorems

(2009) *Nonlinear Analysis, Theory, Methods and Applications*, 70 (1), pp. 117-125. Cited 1 time.

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^c Department of Mathematics, King Abdul Aziz University, P.O. Box 80203, Jeddah, 21589, Saudi Arabia

Abstract

The purpose of this paper is to discuss some basic problems of the fixed point theory for non-self (single-valued and multivalued) generalized contractions. As consequences, new open operator principles and domain invariance theorems are obtained. The results complement and extend some known results in the literature. © 2007 Elsevier Ltd. All rights reserved.

Author Keywords

Associated field; Data dependence; Domain invariance; Fixed point; Generalized contraction; Multivalued operator; Open operator

Marwani, H.M.^{a b}, Lowry, M.^a, Xing, B.^c, Warner, I.M.^a, Cook, R.L.^{a d}

Frequency-domain fluorescence lifetime measurements via frequency segmentation and recombination as applied to pyrene with dissolved humic materials

(2009) *Journal of Fluorescence*, 19 (1), pp. 41-51.

^a Department of Chemistry, Louisiana State University, Baton Rouge, LA 70803, United States

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^d Department of Chemistry, Southern University at Baton Rouge, Baton Rouge, LA 70813, United States

Abstract

In this study, the association behavior of pyrene with different dissolved humic materials (DHM) was investigated utilizing the recently developed segmented frequency-domain fluorescence lifetime method. The humic materials involved in this study consisted of three commercially available International Humic Substances Society standards (Suwannee River fulvic acid reference, SRFAR, Leonardite humic acid standard, LHAS, and Florida peat humic acid

standard, FPHAS), the peat derived Amherst humic acid (AHA), and a chemically bleached Amherst humic acid (BAHA). It was found that the three commercial humic materials displayed three lifetime components, while both Amherst samples displayed only two lifetime components. In addition, it was found that the chemical bleaching procedure preferentially removed red wavelength emitting fluorophores from AHA. In regards to pyrene association with the DHM, different behavior was found for all commercially available humics, while AHA and BAHA, which displayed strikingly similar behavior in terms of fluorescence lifetimes. It was also found that there was an enhancement of pyrene's measured lifetime (combined with a decrease in pyrene emission) in the presence of FPHAS. The implications of this long lifetime are discussed in terms of (1) quenching mechanism and (2) use of the fluorescence quenching method used to determine the binding of compounds to DHM. © 2008 Springer Science+Business Media, LLC.

Author Keywords

Curvature; Data analysis; Dynamic; Environment; Hydrophobic organic compound; Static; Stern-Volmer; Time-resolved fluorescence

Ahmad, B.^a, Sivasundaram, S.^b

Stability in terms of two measures for perturbed dynamic integro-differential equations on time scales (2009) *Communications in Applied Analysis*, 13 (1), pp. 21-30.

^a Department of Mathematics, Faculty of Science, King Abdulaziz University, P.O.Box 80203, Jeddah 21589, Saudi Arabia

^b Department of Mathematics, Embry- Riddle Aeronautical University, Daytona Beach, FL 32114, United States

Abstract

In this paper, we will give a new comparison theorem that connects the solutions of perturbed and unperturbed dynamic systems in terms of two measures on time scales. © Dynamic Publishers, Inc.

Author Keywords

Stability; Strict stability; Time scales; Two measures; Variation of Lyapunov method

Author Index (2009)

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