JDD2023 :8-9 Mai 2023

Experimental study and modelling of convective drying of a porous medium of olive pomace

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Code : 467536 **Commission** : physique **Poster**:PP1

Mots clés : grignons d'olive, séchage convectif, modèles mathématiques

Abstract :

This work consists at studying the convective drying's kinetics of a granular porous medium consisting in a bed of olive mill solid wastes. The experimental tests were conducted in a closed convection drying loop of hot air. Measurement tests of moisture contents were carried out for five temperature values.Then, three values of drying air velocities; 1±0.01m/s, 1.5±0.01m/s and 2±0.01m/s were respectively considered. The effects of drying air temperature and velocity, the effect of the sample's thickness layer, the initial sample humidity and the composition of the tested samples were the main investigated parameters. Obtained results show that the moisture content decreases when increasing the temperature and the velocity of the drying air. Also, the drying time corresponding to the olive pulp is smaller than that of olive pits and of raw pomaces. In addition, it was concluded that sample's thickness layer affects significantly the drying time. Nine thin layer drying models were tested and the Midilli et al.'s model seems to be in best agreement with our results given the regression value R2 and the reduced value $\chi 2$. Consequently, the effective moisture diffusivity the activation energy (Ea)were evaluated

JDD2023 :8-9 Mai 2023

Improving the morphological, optical and electrical properties of perovskite solar cells through Antisolvent treatment

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Code : 468376 **Commission** : physique **Poster**:pp2

Mots clés : Perovskite, Solar cells, Antisolvent, Electro, optical properties

Abstract :

Organic-inorganic metal halide perovskite solar cells have received a great potential for the next generation solution processed photovoltaic device. Controlling the morphology of perovskite films is a key factor to achieve high performance. In this context, various methods have been developed such as interface engineering, anti-solvent engineering, additive assisted deposition and vacuum treatment. Among them Anti-solvent engineering is one of the most common and widely used in one-step deposition processes to obtain high quality perovskite films. For this reason, in this study, we report the effect of the anti-solvent on the morphological, optical, chemical composition and electrical properties of the fabricated perovskite films. The obtained results showed that the addition of the Anti-solvent enhance the perovskite properties and improve the power conversion efficiencies (PCE) of the fabricated devices. Therefore, we anticipate that this anti-solvent treatment will be a viable method to produce high-quality perovskite films with good electro-optical properties.

JDD2023 :8-9 Mai 2023

Synthèse et caractérisation des matériaux hybrides à base apatitique: Application dans des réactions d'adsorption des polluants

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Code : 468549 **Commission** : physique **Poster**:pp3

Mots clés : Hydroxyapatite greffée par le chitosan / Propriétés de surface / Adsorption / Bleu de méthylène

Abstract :

L'hydroxyapatite est une espèce minérale caractérisée par une surface active. Cela lui permet d'être facilement fonctionnalisée par des groupements organiques pour former des matériaux hybrides. Dans notre étude, nous avons intéressé à la fonctionnalisation de l'hydroxyapatite par le chitosane avec différents rapports molaires Chit/HAp (xChit-HAp), synthétisé par la méthode de co-précipitation. Nous avons choisi d'appliquer ces matériaux hybrides dans l'adsorption du colorant bleu de méthylène (BM) comme une réaction modèle et de tester leurs propriétés de surface.

JDD2023 :8-9 Mai 2023

Taguchi method - Artificial Neural Network Approach for the Optimization of High-Efficiency Microfluidic Biosensor

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Code : 468634 **Commission** : Electro **Poster**:pp4

Mots clés : Artificial Neural Network (ANN), ANOVA, Biosensors, Microfluidic, Numerical simulation, Optimization, Taguchi.

Abstract :

A Taguchi orthogonal L8(27) network was adopted to design the numerical assays considering the confining flow parameters (such as, Reynolds number, Damköhler number, relative adsorption capacity, equilibrium dissociation constant, Schmidt number, confinement coefficient and dimensionless confinement position) on the response time of microfluidic biosensors. Signal-to-noise ratio analysis is used to determine the most effective combinations of control parameters to reduce response time. Analysis of variance is used to determine the contribution of control factors to detection time. A predictive model based on artificial neural networks was developed to accurately predict the response time of the microfluidic biosensor. This study concludes that the minimum detection time is acheived when all the factors are at level 2 (i.e.: Re = 10–2, Da = 1000, σ= 0.5, KD = 5, Sc = 105, α = 2 and X = 2). The relative adsorption capacity, Damkohlar number and Reynolds number have contribution of 37%, 17% and 15% respectively. The other factors have a response time contribution of less than 10%. Based on the correlation coefficient and the value adjustment factor, the ANN model performed better in terms of prediction accuracy.

JDD2023 :8-9 Mai 2023

Valorization of grape seeds by production of activated carbon: Application to the retention of a drug residue present in water

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Code : 468708 **Commission** : physique **Poster**:pp5

Mots clés : Activated carbon, Thermochemical activation H3PO4, Iodine value, Methylene blue value, Paracetamol, Adsorption

Abstract :

The elaboration of activated carbons from vegetable waste has been the subject of numerous studies for its applications. This work deals with the synthesis of activated carbons from grape seeds (an industrial waste) by thermochemical activation H3PO4 and its application to eliminate the commercial paracetamol present in water. The prepared charcoal was characterized by iodine and methylene blue indices, surface function determination, pHpzc, specific surface area determination and pore size distribution. Modeling of paracetamol adsorption isotherms is also discussed. The fitting of the isotherms showed that our experimental results agree with the Langmuir model (R2 = 98.80 %) with a maximum adsorption capacity (Qmax) is 76 mg. g-1. These results obtained demonstrate the possibility of valorization of this kind of waste, it is very interesting from the economic point of view and applicable to the purifications of polluted waters.

JDD2023 :8-9 Mai 2023

Improving the performance of planar perovskite solar cells via anti-solvent treatment

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Code : 468841 **Commission** : physique **Poster**:pp6

Mots clés : perovskite solar cells, anti, solvent treatment, improved efficiency

Abstract :

Perovkiste materials have emerged as promising candidates for use in optoelectronic devices, owing to their exceptional combination of high efficiency, low cost and simple preparation process. However, achieving high-quality perovskite films with reproducible performance and stability remains a significant challenge. Anti-solvent engineering is a commonly used method to produce high-quality perovskite films. In this work, we investigated the effect of different types of anti- solvents on the preparation of double cation perovskite active layers. The characteristics of the perovskite solar cell (PSC) devices were analyzed using UV-Visible spectroscopy (UV-Vis), photoluminescence (PL), current-voltage (J-V) measurement and external quantum efficiency (EQE). The obtained results showed that the use of anti-solvent with a low boiling point contributes to superior efficiency, reproducility and stability of PSCs.

JDD2023 :8-9 Mai 2023

Modeling on heat and mass transfer in a grain storage metal silo : using wheat as model material

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Code : 469103 **Commission** : physique **Poster**:pp7

Mots clés : Cooling air, Heat and mass transfer, Metal storage bin, Ventilation.

Abstract :

Modeling stored-grain has become an indispensable part of the grain sector to describe the theory of heat and mass transfer in cereals storage bin during ventilation with cooling air. Therefore, a careful monitoring of the grain mass parameters during this time is required. The main physical factors affecting grain storage are temperature and moisture content. Thus, higher temperature and moisture content increases respiration rate due to spoilage or mold growth and enzyme activity, and will affect the ability of stored grains to germinate. Cold temperatures will not damage stored cereals or pulses; hence, an aeration system is a convenient and economical means to solve those problems. Unlike the previous papers on this aspect, the present work developed a mathematical model based on coupled transport-governing differential equations to simulate distribution in temperature and moisture content of wheat grain in a metal storage bin during ventilation using ANSYS Fluent Software package developed from the discipline of computational fluid dynamics (CFD). The model are applicable for predicting temperature and moisture content of different stored grains under various ventilation conditions.

JDD2023 :8-9 Mai 2023

a highly selective fluorescence and colorimetric turn-on sensor for Al3+

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Code : 469106 **Commission** : physique **Poster**:pp8

Mots clés : schiff base, turn, on, chemosensor, carbazole

Abstract :

A new Schiff base chemosensor containing carbazole moiety CrAp was synthesized and characterized by 1H NMR and FT-IR spectroscopies. The sensing action was studied by fluorescence spectroscopy in presence of Al(III), Cr(III), Mn(II), Fe(III), Co(II), Ni(II), Cu(II), Zn(II), Cd(II), Cs(I) and Pb(II) in THF-H2O medium. For this, 20 equivalents of different metals ions were added separately to the solution of the ligand CrAp. A short time after adding cations, the colour of the solution containing Al3+ changed from yellowish to colorless and no such change was observed with other metal ions. Furthermore, the solution CrAp+Al3+ shows an intensive emission under UV-irradiation at 365nm. These results confirmed the colorimetric sensing behaviour of sensor towards aluminum ions.In another hand, with the excitation at 325 nm, the emission intensity of the probe increases massively in the presence of 1 equivalent of Al3+ : a turn on fluorescence phenomenon[1]. No other metal has any significant effect on the enhancement of the emission intensity of the probe in the detection process for either of the metal ions. The titration of aluminum and with drawing the Job's Plot, the stoichiometry ratio of CarAp-Al3+ was determined as 1:1 and a detection limit of 400 nM.

JDD2023 :8-9 Mai 2023

Energy management and load forecasting in Smart grid

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Code : 469208 **Commission** : Electro **Poster**:pp9

Mots clés : long short term memory, simple RNN, energy forecasting, mean squared error, Mean Absolute Error, Root Mean Squared Error, Mean Absolute Error

Abstract :

Energy consumption has increased considerably over the past few decades. This expansion then suggests a future interest in the use of electricity wholesalers. Predicting energy consumption requires in this work to propose two approaches, one based on long short-term memory (LSTM) and the other based on simple RNNs based on recurrent neural networks. These models take into account electricity consumption. The modeling data are from Global Energy Forecasting 2012. To evaluate the performance of the two models, four techniques are used: MSE (Mean Squared Error), MAE (Mean Absolute Error), RMSE (Root Mean Square Error) and MAPE (Mean Absolute Percentage Error) in order to validate the best available method

JDD2023 :8-9 Mai 2023

IDS-SVM for intrusion detection in IoT Network

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Code : 469235 **Commission** : Electro **Poster**:pp10

Mots clés : Cybersécurité, IoT Network, Intrusion Detection System, Machine Learning, Support Vector Machine

Abstract :

The Internet of Things (IoT) has become one of the fastest growing technologies and has been widely used in several fields. IoT networks contain millions of devices capable of interacting with each other and delivering functionality that was never previously available. These IoT networks are designed to provide smart operations by analyzing big data from information generated or gathered from an abundance of real-time devices. However, the diversity and heterogeneity of IoT devices make IoT network environments more complex and vulnerable to various attacks than conventional computer networks. In this article, we propose an Intrusion Detection System based on machine learning algorithm named Support Vector Machine to alleviate the serious issues that IoT networks faces. In order to evaluate the proposed IDS, we have performed experiments on NSL-KDD dataset and the experimental outcomes show that this model achieves the highest accuracy in both binary and multiclass classification compared to the literature.

JDD2023 :8-9 Mai 2023

Optical study of the Ga2O3/BGaAs/GaAs heterostructures based on III-V materials

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Code : 469283 **Commission** : physique **Poster**:pp11

Mots clés : GaAs, BGaAs, Ga2O3, Photoluminescience

Abstract :

Photoluminescence (PL) spectroscopy supports optical studies of Ga2O3/GaAs, BGaAs/GaAs and Ga2O3/BGaAs/GaAs heterostructures obtained by chemical vapor deposition (MOCVD) at different growth temperatures (580°C and 670°C). The strain effects in the BGaAs/GaAs quantum well are compensated due to the gallium oxide layer (%B =1.5%). PL measurements show the presence of an emission around 1.2 eV and a red shift after the deposition of Ga2O3 on BGaAs/GaAs at low temperature (10K). The PL excitation density study highlights the dominance of the Ga2O3 layer during emission via donor-acceptor transitions. The evolution of the emission energy as a function of the temperature of the BGaAs/GaAs thin film allowed us to explain the origin of excitonic recombination. The luminescence within the new Ga2O3/BGaAs/GaAs heterostructure is governed by the carrier localization energy due to fluctuation potentials created by the inhomogeneous distributions of the VGa families.

JDD2023 :8-9 Mai 2023

Experimental Design and PSO-Artificial Neural Network for microfluidic biosensor optimization under AC electrokinetic effects

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Code : 469309 **Commission** : Electro **Poster**:pp12

Mots clés : ACET, ANN, PSO, biosensors, Microfluidics, Numerical simulation, Optimization

Abstract :

The objective of this work is to perform a finite element simulation on the binding kinetics of a biosensor under alternating current electrothermal effect (ACET). The optimization of some control factors such as the bias voltage, the height of the channel, the width and the position of the sensitive surface on the response time of the microfluidic biosensor was carried out via a design of experiment. Analysis of variance was used to determine the contribution of each factor. A predictive model based on artificial neural networks (ANN) with particle swarm optimization (PSO) was developed to predict the response time of the microfluidic biosensor with electrothermal effect. A significant reduction in response time was obtained for an optimal combination of these control factors. The values of R2 and RMSE calculated by the PSO-ANN model showed high reliability in estimating the response time of the microfluidic biosensor.

JDD2023 :8-9 Mai 2023

Electronic structure and possibility of laser cooling of BaLi + and BaNa + molecular ions

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Code : 469314 **Commission** : physique **Poster**:pp13

Mots clés : Keywords: Potential energy curves, Dipole moments, Radiative lifetimes, Einstein coefficients, spin, orbit coupling

Abstract :

Alkaline-earth and alkali-metal mixtures have been the subject of many experimental and theoretical studies because of their exciting electronic structure adapted to laser cooling[1-8]. We exhibit a theoretical investigation for ground and low-lying excited electronic states of the ion-atom mixtures BaLi + and BaNa + . This study is performed by the multi-reference configuration interaction (MRCI) method in combination with optimized basis sets and non-empirical pseudopotentials for Ba, Na and Li atoms. With this ab-initio approach we determined the adiabatic potential energy curves, permanent and transition dipole moments with and without spin orbit effects of the 1,3 ❮ + , 1,3 Π and 1,3 ✎ symmetries. The spectroscopic
constants of BaLi + and BaNa + molecules are in good agreement with those of Śmiałkowski.M,
and Tomza.M [9]. Furthermore, the elastic scattring proprieties at low energy for the ground states of both molecules are theoretically investigated. Then, the vibrational level energies using the Numerov method, as well as the radiative lifetimes of vibrational states of the ground and the first excited states are determined and analyzed after determination of spontaneous and stimulated emission transition rates[8].
The Franck-Condon factors are also calculated and the possibility of laser cooling is discussed for these molecular ions[10].

JDD2023 :8-9 Mai 2023

Amélioration de la réponse d'une OLED à base de PPV : Effet du dopage et des paramètres technologiques

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Code : 469345 **Commission** : physique **Poster**:pp14

Mots clés : Organic semiconductor, MEH, PPV, Organic light, emitting diode (OLED), TCAD simulations

Abstract :

Récemment, une étude multi-échelle a été menée au sein de notre équipe pour mettre en relief le rôle des propriétés optoélectroniques des différents stéréo-isomères du PPV. Il a été montré qu'une application microélectronique à savoir la fabrication d'une OLED multicouche est prometteuse. Le stéréo-isomère E-E se manifeste comme une molécule avec des meilleures propriétés d'absorption et d'émission avec une faible énergie de gap (Eg=3.39 eV). Ces résultats encourageants, nous ont poussés d'approfondir notre étude d'avantage. Dans le présent travail, nous envisageons améliorer les performances du dispositif OLED à base PPV. Pour atteindre cet objectif, nous avons étudié l'effet du dopage de la couche émettrice (PPV) et également l'effet de la couche transporteuse de trous. A travers cette étude, nous avons pu montrer une amélioration des performances de notre OLED telles que: · La tension d'allumage (aller à des valeurs inférieures à 6V). · La luminance/ radiance. · L'épaisseur de la zone de recombinaison. · Le Rendement quantique externe(EQE). En conclusion, le présent travail d'optimisation du dispositif OLED à base de PPV s'est révélé d'une importance appréciable, et ceci en ajustant les paramètres optoélectroniques et technologiques pour aboutir à un meilleur fonctionnement du dispositif électronique et faciliter d'avantage l'étape de fabrication.

JDD2023 :8-9 Mai 2023

Optimisation d'un algorithme de chiffrement pour la sécurité des données de santé IoT

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Code : 469370 **Commission** : Electro **Poster**:pp15

Mots clés : Chiffrement par bloc léger / Sécurité des données de santé / Dispositifs IoT / Optimisation d'algorithme / Consommation d'énergie / Ressources / Implémentation sur FPGA / Performances / Vitesse / Cryptographie / Protection des données / Contraintes IoT

Abstract :

Ce travail consiste à optimiser et implémenter un algorithme de chiffrement par bloc léger pour protéger les données de santé. Nous avons étudié les exigences de sécurité pour les données de santé et choisi un algorithme de chiffrement adapté. Nous avons ensuite optimisé cet algorithme pour minimiser la consommation d'énergie et de ressources tout en assurant une sécurité adéquate. Nous avons implémenté l'algorithme sur une carte FPGA et évalué ses performances en termes de vitesse et de consommation d'énergie. Les résultats montrent que l'algorithme de chiffrement léger est efficace pour protéger les données de santé tout en étant adapté aux contraintes des dispositifs IoT.

JDD2023 :8-9 Mai 2023

Real-time pedestrian detection independent of illumination dedicated for automotive applications

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Code : 469405 **Commission** : Electro **Poster**:pp16

Mots clés : Computer Vision, Artificial intelligence, Pedestrian, real time, Autonomous Cars, Yolo V5

Abstract :

With the rising popularity of autonomous cars, research is exploring the boundaries of what is possible with taking in consideration safety. However, by having a vision based detection system, we arrive at the same limitation of the human eye, which is lighting conditions. Taking that in consideration , an expanded vision spectrum from visible to infrared will allow the detection of the thermal signature of the human body even in low light. In this reaserch, our contribution is establishing a real time detection of pedestrians both on visible and thermal images by training multiple YOLO models with modified KAIST dataset and comparing their performance for real time applications. Out results concluded that YOLO v5 had the best compromise between speed 31 FPS for 640 X 480 input image and a missrate of 32.5.

JDD2023 :8-9 Mai 2023

Conception d'un accélérateur matériel sur FPGA dédiés au Machine Learning

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Code : 469570 **Commission** : Electro **Poster**:pp17

Mots clés : Système Embarqué, Accélérateur matériel, Intelligence Artificielle, FPGA

Abstract :

Les ressources de calcul reconfigurables de type FPGA sont de plus en plus considérées comme
une solution efficace pour l'accélération des algorithmes qui demandent une puissance de calcul
potentielle. Le principe est de migrer les parties les plus coûteuses de l'algorithme en termes de
temps de calcul, vers une architecture matérielle spécifique, implémentée sur un FPGA. Outre les possibilités de parallélisme offertes ainsi que la possibilité de réaliser une structure matérielle dédiée, des facteurs d'accélération importants peuvent être obtenus.
Ce sujet consiste à proposer une approche permettant la description et l'implémentation des algorithmes d'apprentissage automatique sur des accélérateurs FPGA. La description proposée est entièrement conçue par OpenCL. La mise en œuvre de FPGA peut être entièrement réalisée
sans avoir besoin du code HDL. Le type d'apprentissage choisi est le Machine Learning.

JDD2023 :8-9 Mai 2023

Etude comparative entre différents algorithmes de suivi du point de puissance maximale pour les systèmes photovoltaïque

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Code : 469583 **Commission** : Electro **Poster**:pp18

Mots clés : systeme photovoltaique, MPPT, Perturbation et Observation, incrementation de conductance, logique floue

Abstract :

Nous proposons une étude comparative entre différents algorithmes de suivi de point de puissance maximale en termes d'efficacité, de précision et de rapidité. Ces méthodes sont des méthodes traditionnelles et méthode intelligente. Les méthodes traditionnelles sont: la méthode de perturbation et d'observation et la méthode de l'incrémentation de conductance et la méthode intelligente est la logique floue. le système étudié dans ce poster est composé d'un module photovoltaïque qui fournit de l'énergie à une charge à travers un étage d'adaptation qui est un convertisseur élévateur commandé par les commandes MPPT. La validité et les performances des techniques MPPT proposées sont démontrées en réalisant plusieurs scénarios de simulation dans différentes conditions environnementales. La mise en œuvre de la simulation est développée numériquement en utilisant MATLAB/Simulink.

JDD2023 :8-9 Mai 2023

Ab initio characterization of the Kr–Li2+ van der Waals complex: Intermolecularpotentials and vibrational bound states

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Code : 469601 **Commission** : physique **Poster**:pp19

Mots clés : potential energy surface, Molpro, vibrational bound states, van der Waals

Abstract :

The potential energy surface PESs of Kr-Li2+complex have been generated by the coupled cluster with single and double and perturbative triple excitations (CCSD(T)) method [1-2] employing correlation consistent atomic basis sets and extrapolated to the complete basis set (CBS) limit In the present work, the Jacobi coordinate system was used. The center of coordinates is placed in the center of mass of the Li2+ molecule and vector R connects this center and Kr. The topology of the surface is investigated by an interpolation method based on the RKHS approach [4]. In turn, the RKHS interpolated PESs are used to compute the vibrational bound-state of the ground Kr–Li2+ vdW states. Radial and angular distributions computed for all bound states (J=0) of both odd and even symmetry. The states that lie below the 90° barrier correspond to Kr atoms strongly localized in one of the linear geometries and with populations in the region of the barrier maxima states. For a state below the n=114 barrier, the radial and angular distributions have a more complicated. In the highest states (n = 115 - 260), the location of the radial and angular distributions become very different with energies above the angular barrier.

JDD2023 :8-9 Mai 2023

Dielectrice, Magnetic, and Electrical Properties of Cu0.6Mg0.2CO0.2Fe2O4 Ferrites Synthesized Using Sol-Gel Method Under Different Sintering Temperatures

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Code : 469615 **Commission** : physique **Poster**:pp20

Mots clés : Spinel ferrites · microstructural properties · magnetic and Dielectric properties · magnetic and optoelectronic applications

Abstract :

Spinel ferrites with general formula AB2O4 are widely used in electronic applicationssuch as gas sensors, information storage systems, computer memory chips, microwave devices, magnetic recording me-dia, transducers, transformers, and other devices. Thesenumerous applications are due to the fact that these materialshave excellent properties such as high initial permeability,high saturation magnetization,high resistivity, and low mag-netic losses. Research which has been conducted on ferritematerials showed that many parameters could affect theirproperties.Int his context, many studies have been presented in the literature. In the present study, Cu0.6Mg0.2Co0.2Fe2O4 ferrites were synthesized using sol-gel method under different sintering temperatures. XRD patterns with the Rietveld refinement indicate that samples crystallize in the cubic spinel structure. The increase of sintering temperature leads successively to the increase of lattice constant, average, magnetization, and electrical conductivity of the prepared ferrites. Dielectric constants decrease with frequency and their behaviors have been investigated using the interfacial polarization theory predicted by Maxwell. The modulus analysis shows the presence of electrical relaxation phenomenon and non-Debye nature for the samples. An appropriate electrical equivalent circuit was used to

analyze the Nyquist plots, and the results show that the conduction mechanism of the synthesized ferrites is mainly due to the grain boundary contribution

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Facile synthesis and characterization of Fe3O4-D-tryptophan nanoparticles for methylene blue adsorption.

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Code : 469616 **Commission** : physique **Poster**:pp21

Mots clés : Synthesis, magnetite nanoparticles, amino acid, MB, adsorption

Abstract :

Nanoparticles of iron oxide have been drawing a considerable interest because of its properties and diverse applications, particularly the magnetite Fe3O4. These are bio-friendly, non-toxic and are able be controlled through an external magnetic field. In this work, the amino acid-modified magnetite nanoparticles were synthesized by immobilizing D-tryptophan on the surface of magnetite nanoparticles (Fe3O4) by a co-precipitation method. The obtained nanoparticles were characterized by X-ray diffraction (XRD), scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS), Fourier infrared transform (FTIR), Raman and transmission electron microscopy (TEM). The results of XRD, SEM-EDX confirmed the formation of pure magnetite phase and the pure Fe3O4@D-tryptophan with uniform surface and a spherical shape of the particle. FTIR and Raman analysis revealed the vibrational assignment of the functional groups of D-tryptophan and Fe-O bands. TEM analysis confirmed the calculated crystallite size from XRD with an average of less than 10 nm. The adsorption properties of Fe3O4@D-tryptophan were evaluated for the cationic dye BM. Both the adsorption isotherm and kinetic studies show that adsorption is consistent with the Freundlich model and can be better defined by the pseudo-second order kinetic model. The thermodynamic parameters indicated a spontaneous and exothermic adsorption process.

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Synthesis and characterization of rare earth doped luminescent nanoparticles for biological applications.

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Code : 470003 **Commission** : physique **Poster**:pp22

Mots clés : Ag 2 S nanoparticles, cytotoxicity, cellular imaging, NIR, I emission

Abstract :

Our work describe a simple chemical route for preparing silver sulfide nanoparticles (Ag2S) stabilized with thioglicolic acid (TGA). The structural and the optical propreties of the obtained product were caracterised by using different spectroscopic techniques.The obtained Ag2S nanoparticles are highly luminescent in the NIR-I biological window.These NIR NPs present excellent cytocompatibility even at 100 ug/mL with U87 cells. These results have opened up the possibilities of using our nanoparticles for cell imaging and luminescence thermometry

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Catalytic activity of green synthesized gold nanoparticles for photocatalytic degradation of Methylene Blue

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Code : 470008 **Commission** : physique **Poster**:pp23

Mots clés : AuNPs catalytic activity, Methylene blue, photocatalytic activity, dye degradation

Abstract :

Photocatalytic degradation of organic pollutants is an effective and environmentally friendly method for wastewater treatment. In this study, the photocatalytic activity of green synthesized gold nanoparticles (AuNPs) catalysts was investigated for the degradation of methylene blue under UV irradiation. The synthesized catalysts were characterized in previous studies and showed pseudo-spherical, triangular, and hexagonal AuNPs forms [1]. The photocatalytic degradation using AuNPs catalysts and hydrogen peroxide (H2O2) reagent in the presence of UV light involves the activation of H2O2 molecules by UV light, which leads to the generation of highly reactive hydroxyl radicals (OH•). The experimental results showed that the AuNPs catalysts showed efficient photocatalytic degradation of methylene blue, with a degradation efficiency of up to 95% within 120 minutes of irradiation in the presence of hydrogen peroxide. Furthermore. Our study provides new insights into the mechanism of photocatalytic degradation using AuNPs catalysts and highlights their potential application for water treatment.

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Étude et implémentation des outils de virtualisation des architectures reconfigurables

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Code : 471319 **Commission** : Electro **Poster**:pp24

Mots clés : FPGA, Système temps réel, virtualisation, abstraction, multi, threading, reconfiguration dynamique partielle (RDP)

Abstract :

Avec la grande demande sur les dispositifs portables à haute performance et à forte densité logique, le besoin en surface de silicium a augmenté considérablement ces dernières années. Une solution potentielle est la reconfiguration dynamique partielle (RDP). Elle consiste à effectuer des mises à jour ou d'ajuster des fonctionnalités sans interrompre les services en cours d'exécution. Dans un but de simplification et d'amélioration de l'exploitation et de manipulation de la RDP, nous nous proposons, dans ce travail, d'apporter une contribution à l'étude et à la mise en œuvre d'un système d'abstraction de la RDP à base d'un noyau Linux personnalisé.

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Study and Realization of Macro-Piezoelectric accelerometer sensor for an inertial measurement unit (IMU)

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Code : 471852 **Commission** : Electro **Poster**:pp25

Mots clés : Inertial Measurement Unit (IMU), accelerometer, gyroscope, linear acceleration, angular velocity, piezoelectric, seismic mass, 6 degrees of freedom

Abstract :

The IMU sensor is an electronic module composed of both 3-axis accelerometers and 3-axis gyroscopes components, to provide linear and angular motion detection. IMUs are widely used in applications such as navigation, robotics, aerospace, and military. The studied IMU structure is composed of three concentric rings connected; a seismic mass, a second ring for constraint generation, and a piezoelectric ring located on top to convert mechanical constraint to electrical potential. The advantages of the new piezoelectric motion sensor are simultaneous detection of 6 degrees of freedom using a single seismic mass. The simulation of the accelerometer part, of the IMU, was elaborated using the finite element method (FEM) to determine the electrical (sensitivity) and mechanical performance (displacement...). The FEM simulation result showed a sensitivity of 1.7 V/g and 0.45 V/g for (x/y-axis) and (z-axis) applied linear accelerations, respectively. A practical realization of the optimized system has been successfully developed, and the measurement results showed that our sensor gives a sensitivity of 0.83 V/g along the (x/y axis) and 0.7 V/g along the (z-axis). The difference between the Results found from FEM simulations and experimental values is due to the change from Elinvar material to rubber material in the manufacturing process.