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Number of Research Papers in the Journal notified on the UGC website during the Academic Year 2022-2023

S. No	Title of the Paper	Name of the author/s	Department of the teacher	Name of Journal	Year of publication	ISSN Number	Link to article / paper/ abstract of the article
1	Segmentation & Classification of Gallstone in Ultrasound images of Gallblader using Support Vector Machine	Dr.M.Sathya Priya	ECE	IEEE	2023	DOI:10.1109/ICCNT54827.2022.9984361	View
2	Classification of Diabetic disorder using Machine Learning Approaches	C.Shalini	ECE	IEEE	2023	DOI: 10.1109/ICCPC55978.2022.10072213	View
3	Classification of Diabetic disorder using Machine Learning Approaches	Dr.S.Velmurugan	ECE	Computer System Science and Engineering	2023	0267-6192 Scopus ID:57211152131	View

4	Effect of Kariba Weed Biodiesel Blended with n-Pentane on the Chosen Parameters of a Ceramic-Coated Thermal Barrier Direct Injection Diesel Engine	Dr. E. Sivakumar	MECH	ACS Omega	2023	2470-1343	View
5	Investigation of ceramic coating on operating characteristic of DI CI diesel engine fuelled with safflower methyl ester	Dr. E. Sivakumar	MECH	Materials Today Proceedings	2023	2214-7853	View
6	Investigation of Effect of Tool Offset Position on Mechanical Properties Of Dissimilar Aluminium Alloy Sheets Joined By	M.Prakash	MECH	Materials Today Proceedings	2023	2214-7853	View

	Friction Stir Welding						
7	Effect of thermal barrier coating of piston on the performance of diesel engine	Sathya moorthi S	MECH	Materials Today Proceedings	2023	2214-7853	View
8	Growth, optical, dielectric and mechanical studies in ferroelectric bis(methyl ammonium) tetrachlorocadmate single crystal	S. Anitha	PHYSICS	Ferroelectrics	2023	0015-0193	View
9	Retrieving Images and Its Classification by Acumen Mechanism Using Texture Features	Satheesh. S	MATHS	International Journal of Food and Nutritional Sciences	2023	2320 –7876	View
10	Optical and piezoelectric	S.Arjunan	PHYSICS	European Chemica	2023	5265-5270	View

	studies of an efficient frequency doubler :lmidazolium L-Tartrate(IMLT)			Bulletin			
11	Exploration of third order NLO property of semi-organic optical material: Bis (L-thrconine) copper (Il) monohydrate [BLTCM)	S.Arjunan	PHYSICS	European Chemica Bulletin	2023	5650-5657	View

Segmentation and classification of Gallstone in ultrasound images of gall bladder using Support Vector Machine

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Abstract— The gallbladder is a hollow organ located just below the right lobe of the liver. Gallstones form in the gallbladder, a small organ located below the liver. The gallbladder aids in the digestive process by storing bile and releasing it into the small intestine when food is ingested. In this work, spatially weighted fuzzy C Means clustering is used to automatically extract the gallstone from gall bladder image. A batch of 25 normal gallbladder ultrasound images and 75 gallstone images are used. Haralick texture features are used to classify normal and gallstone images. The sensitivity, specificity, and accuracy of the Support Vector Machine classifiers are 92%, 80% and 88.56%, respectively.

Keywords—Gallbladder, ultrasound image, Gallstone, Spatially Weighted Fuzzy C Means, Support Vector Machine

I. INTRODUCTION

In adults, the gallbladder measures approximately 8 centimetre in length and 4 centimetres in diameter when fully distended. The gallbladder has a capacity of about 100 millilitres. The gallbladder has the shape of a tapering sac, the open end of which opens into the gallbladder tree and cystic duct. Anatomically, the gallbladder is divided into three sections: Fundus, Body, and Throat. The main function of the gallbladder is to store bile, also called gall. The gallbladder is part of the biliary system and serves as a reservoir for bile produced by the liver. The neck tapers and is continuous with the cystic duct, part of the Bilary tree.

The main purpose of the gallbladder is to store bile, also called gall. The gallbladder is part of the bilary system and serves as a reservoir for bile, which is produced by the liver. The liver produces the bile and then it flows through the hepatic ducts into the gallbladder. At any one time, 30-60 millilitres of bile is stored within the gallbladder. Gallstones are the most common problem to affect the gallbladder. Gallstones generally form because the bile is saturated with either cholesterol or bilirubin. Only the minority of gallstones cause symptoms, and the majority of stones are passed along the bilary tree. Inflammation of the gallbladder is called cholecystitis. Most commonly, the inflammation is due to obstruction of the bile duct by gallstones, called cholelithiasis. Ultrasound examination is the first imaging technique used to diagnose gallbladder disease. Some of the gallbladder diseases are gallstone, biliary sludge, biliary polyps. Measurement of gallbladder wall thickness to diagnose cholecystitis. Ultrasound is the first imaging technique for the diagnosis of gallbladder disease. Some of the gall bladder diseases are Gall stone, Bilary sludge, Gall poly. Measurement of gall bladder wall thickness for the diagnosis of cholecystitis. Ultrasound is the initial imaging modality for diagnosing gallbladder disease. Figure 1 shows the structure of gallbladder.

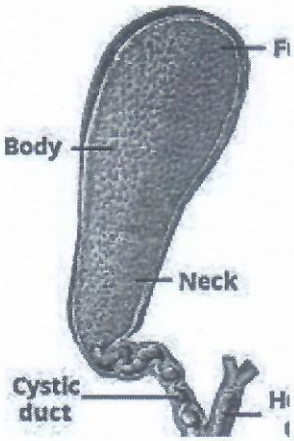


Fig. 1 Structure of Gallbladder

Ultrasound is the initial imaging modality for diagnosing gallbladder disease. Some of the gall bladder diseases are Gall stone, Bilary sludge, Gall poly. Measurement of gall bladder wall thickness for the diagnosis of cholecystitis. Ultrasound imaging is cheaper compared to MRI technique and it gives clear pictures of soft tissue. Ultrasound imaging is the best method to differentiate solid from cystic masses. Image segmentation is done to identify the boundary of gall

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Classification of Diabetic Disorder using Machine Learning Approaches

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***Abstract*- Diabetes is a serious metabolic condition that can affect the entire body. Untreated diabetes raises the risk of heart stroke, diabetes, and other conditions. Millions of individuals are impacted by this disease around the globe. A chronic illness like diabetes may have an effect on world health. In Accordance to the International Diabetes Federation, 382 million people suffer from diabetes all over the world. This would increase to 592 million by 2035. High blood glucose levels cause diabetes, also referred to as diabetes mellitus. Numerous conventional methods based on physical and chemical investigations can be used to diagnose diabetes. Maintaining a healthy lifestyle requires early diabetes identification. Mechanical studies are a potential technique that can aid in early disease diagnosis and assist medical professionals in making diagnoses. Our goal is to use the Scikit-learn tool to develop a classification model that uses the KNN, MLP, SVM, RFC, and CART algorithms to predict diabetes.**

Keywords—Random Forest, KNN, SVM, Multi-Layer Perceptron, CART, Diabetes Mellitus.

I. Introduction

Worldwide, 415 million people have diabetes, a chronic non-communicable metabolic disease (NCD) that is expected to afflict 642 million people by the year 2040. India has the second-largest percentage of diabetes in the globe. Diabetes can develop when the pancreas generates insufficient amounts of insulin or when the body's immune system is not resistant to the insulin it produces. Diabetes has a negative impact on people's lives and finances. If diabetes individuals are not treated, it might result in heart disease, skin problems, and problems with vision. Machine learning has made significant advancements in the medical and healthcare fields during the past five years. owing to machine learning's effective operation, which is used in many real-time algorithms. Medical professionals must therefore recognize and make a diagnosis of the early phases of human peace.

II. Diabetes Classification

More than 200 million people worldwide are affected by Diabetes Mellitus (DM), one of the most prevalent endocrine illnesses. In the following years, it is anticipated that diabetes will become more common. There are various ways to categorize DM. According to the etiopathology of the condition, type 1 diabetes (T1D) and type 2 diabetes (T2D) are the two main clinical presentations. Type 2 diabetes (T2D), which is largely characterized by insulin resistance, affects 90% of diabetics. T2D is supposed to be mostly brought on by way of living, exercise, alimental choices, and hereditary, whereas T1D is believed to be brought on by autoimmunological destruction of the Langerhans islets harboring pancreatic cells. Around 10% of people with diabetes have T1D, and 10% of those people go on to develop idiopathic diabetes. Type 1 diabetes (T1D) and type 2 diabetes both have different etiopathology (T2D). According to the insulin secretion profile and/or onset, different kinds of DM include gestational diabetes, endocrinopathies, MODY (Maturity Onset Diabetes of the Young), and neonatal, mitochondrial, and neonatal diabetes. A few of the symptoms of DM include extreme weight loss, polydipsia, and polyuria. The diagnosis is impacted by blood sugar levels (fasting plasma glucose = 7.0 mmol/L).

III. Risk Factors for Type 1 Diabetes

Type 1 diabetes is an unclear exact etiology, but a variety of things could point to a higher risk, including Family history: If a parent or sibling has type 1 diabetes, the risk is enhanced. Environmental elements: Things like bacterial infections may have an impact on type 1 diabetes. An autoantibody test may be performed on family members of type 1 diabetics to check for the presence of immune system-damaging immune cells. Certain autoantibodies increase a person's risk of developing type 1 diabetes. But not all of these autoantibodies result in diabetes. Geographically, type 1 diabetes is a common disease in Finland and Sweden.

IV. Risk Factors for Type 2 Diabetes

Researchers are still trying to figure out why some people develop type 2 diabetes and pre-diabetes while others do not. However, it is evident that some circumstances raise the risk, such as:

Body weight: Their cells can handle insulin more effectively with the fattier tissue they have.

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Logistic Regression with Elliptical Curve Cryptography to Establish Secure IoT

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Abstract: Nowadays, Wireless Sensor Network (WSN) is a modern technology with a wide range of applications and greatly attractive benefits, for example, self-governing, low expenditure on execution and data communication, long-term function, and unsupervised access to the network. The Internet of Things (IoT) is an attractive, exciting paradigm. By applying communication technologies in sensors and supervising features, WSNs have initiated communication between the IoT devices. Though IoT offers access to the highest amount of information collected through WSNs, it leads to privacy management problems. Hence, this paper provides a Logistic Regression machine learning with the Elliptical Curve Cryptography technique (LRECC) to establish a secure IoT structure for preventing, detecting, and mitigating threats. This approach uses the Elliptical Curve Cryptography (ECC) algorithm to generate and distribute security keys. ECC algorithm is a light weight key; thus, it minimizes the routing overhead. Furthermore, the Logistic Regression machine learning technique selects the transmitter based on intelligent results. The main application of this approach is smart cities. This approach provides continuing reliable routing paths with small overheads. In addition, route nodes cooperate with IoT, and it handles the resources proficiently and minimizes the 29.95% delay.

Keywords: Wireless sensor network; internet of things; security; elliptical curve cryptography; machine learning; regression analysis

1 Introduction

WSN is the leading technology necessary for the execution of the IoT structure. IoT's operational ability and energy established the network communication, cost-effectiveness, dependability, stability, and dynamic function [1]. IoT is talented naturally from the internet. The things associated with the internet differ significantly in terms of characteristics. IoT is promising as a dynamic cyber-physical network that

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Article

Effect of Kariba Weed Biodiesel Blended with *n*-Pentane on the Chosen Parameters of a Ceramic-Coated Thermal Barrier Direct Injection Diesel Engine

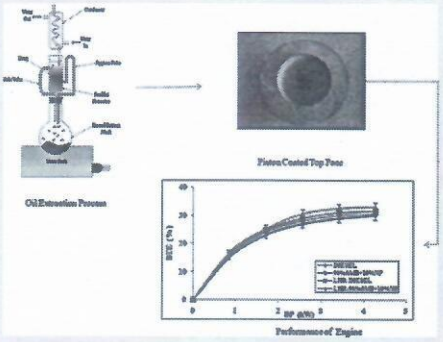
Elumalai Perumal Venkatesan,* Parthasarathy Murugesan, Sivakumar Ellappan, Silambarasan Rajendran, Abdul Aabid, Mohamed Abbas, Chanduveetil Ahamed Saleel, Pradeepkumar Arockiasamy Remigious, and Sreenivasa Reddy Medapati

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ABSTRACT: In this experimental investigation, Kariba weed biodiesel (KSB) blended with *n*-pentane has been tested in conventional and ceramic-coated thermal barrier engines, and the results have been compiled and presented. A single-cylinder, four-stroke, direct injection diesel engine has been used as the test engine with eddy current dynamometer loading as used in the experimental setup. The tests were repeated in various ambient conditions to get an optimal value. Ceramic coating has been done with partially stabilized zirconia by the plasma arc spraying process. Among the quantum of tests conducted, 90% KSB blended with 10% *n*-pentane showed appreciable results when it was compared with the test fuel (neat diesel). The brake thermal efficiency and brake-specific fuel consumption were found to be better when compared with neat diesel. At increasing load, unburnt hydrocarbon, carbon monoxide, and smoke opacity emissions were appreciably reduced.



INTRODUCTION

Tests on alternative fuel sources that are becoming incrementally more accessible have been sparked by the growing demand for energy and expanding discharge.[1] The majority of air pollution on the earth is spread by the subordinate consumption of gasoline. Air pollution, the oil consuming incidental impact, and all leaving animals are generally threats to children's prosperity and are key allies of discrimination.[2] In any event, there is a need to transition to sustainable power resources to meet the expanding demand for and overcome the greater lack of ecologically acceptable power sources. Biofuel would be an option later on because to initiate the discharge principles and the availability of gasoline oil in only a few areas around the world.[3] Biofuels have ethical, reasonable, and environmentally friendly behavior.[4] Analysts examine the value of using oil, which can reduce the cost of producing biodiesel, to make biofuel economically feasible.[57] The limitations of first-generation biofuels are overcome by second-generation biofuels. These are also referred to as olive-green fuel or cellulosic ethanol. They come from non-food yields such wood, waste from forests, waste from food crops, waste from vegetable oil, waste from industries, and ecological biomass crops. There is no doubt that using edible oil is not the ideal choice for a country with as much population as India. Non-edible oils can also be used externally for a number of purposes, including medicine, cosmetics, and light oil. As a result, the price and demand for biodiesel from plants that produce it for human use in any form will surely rise in the future. Additionally, limits with a high thickness are notorious for auto-oxidation, gum plan, and decreased engine determination.[7] Some plants are completely not used in any way, and their removal is not a serious problem like green growth. Full scale and Adityan et al. have taken measures to prevent the aforementioned problems with consumable and unsatisfactory yields.[8] The findings indicated a minor increase in express fuel consumption, poor brake power, and reduced unburnt hydrocarbon emission.[9] The consumption credits of diesel engines running on Spirulina sp. biodiesel and B15 blends were studied and revealed a 5.31% increase in chamber pressure and a 4.92% increase in heat discharge rate. The use of such lubricants in engines without modification will

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Investigation of ceramic coating on operating characteristic of DI CI diesel engine fuelled with safflower methyl ester

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ABSTRACT

As reliance on fossil fuel continued to rise, prices increased due to rapid deterioration in oil supplies and increased emissions, green energy sources such as alternative renewable fuels have been promoted. Biofuel is a compression ignition fuel substitute; It is also possible to enhance the CI biofuel-based engine's performance by transforming it into a low heat rejection engine (LHR). A CI engine's thermal efficiency can be improved with the LHR engine by reducing heat loss to the environment. In this investigation, a ceramic material (Partial Stabilized Zirconium) of approximately 0.5 mm was coated by the plasma spraying on piston crown.The effects of safflower methyl ester (SAME) in the LHR engine along with retarded timing (RT) is compared with the standard one engine in the present work. The results show that the LHR engine's Brake thermal efficiency was more than the standard one. The emission levels of CO and UBHC are lower on the LHR engine compared to the standard one.
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1. Introduction

Biodiesel is a renewable fuel made from plant and animal-based oils and fats, and it offers several advantages over traditional fossil fuels. However, several challenges need to be overcome for biodiesel to become a more widely used and sustainable fuel source. Some of these challenges include:Biodiesel production is dependent on the availability of feedstocks such as vegetable oils, animal fats, and waste cooking oil. Sufficient quantities of these raw materials are not always available, which can limit the scale of biodiesel production.Biodiesel production is currently more expensive than petroleum diesel, making it less competitive in the marketplace. This is due to factors such as the cost of feedstocks, the need for specialized processing equipment, and the lower energy content of biodiesel compared to petroleum diesel.Biodiesel requires specialized handling and storage to prevent degradation, making distribution and transportation more challenging and costly.Biodiesel has different properties than petroleum diesel, including a higher viscosity and lower energy content. These properties can affect engine performance and require adjustments in engines to function properly.There is a lack of consistent standards for biodiesel production, which can make it difficult for producers to meet regulatory requirements and for consumers to know the quality of the biodiesel they are purchasing.Despite its many benefits, biodiesel is not yet widely used, in part due to limited public awareness and understanding of the fuel. Increasing public education and awareness is crucial to promoting its wider adoption.Biodiesel production can also be hindered by technical challenges, such as the need to remove impurities and glycerol from the feedstock, and the challenge of ensuring consistent quality from batch to batch.

Researchers working on internal combustion engines often aim for energy preservation and efficiency [1]. The diesel engine produces typicallyenhanced fuel economy with petrol engine equivalent. Even the diesel engine refuses 2/3 of the fuel's heat energy, leaving a useful power output of remaining. In principle, if the heat was rejected, the thermal efficiencywould be increased, or at least until the limit laid down as perthermodynamics' second law. Low

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Investigation of effect of tool offset position on mechanical properties of dissimilar aluminium alloy sheets joined by friction stir welding

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ABSTRACT

Light alloys like aluminium, magnesium, and their composites can now be joined via friction stir welding to a great extent. In this work dissimilar aluminum alloy sheet AA2024 –AA7075 and AA6063-AA6069 were conducted using H13 high speed tool steel– Square tool pin profile.The tool parameter considered are 1600RPM,traverse 120 mm/min and four offset value as 0 mm,0.5 mm,1mm,and 1.5mmMechanical Properties like tensile strength hardness and bending strength were investigated using standard test procedure.It is clearly observed increase in offset value cause increase in tensile strength in the case of AA202 –AA7075 but insignificant changes observed in the case of AA6063 –AA6069. More hardness is observed in the weldment and comparatively lower value in the HAZ,lowest value in the base metal. Bending strength of the weldments are inferior than base metal, but among the bending strength of the weldments 1.5 mm offset produced better bending strength.
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1. Introduction

Friction-stir welding (FSW) is a solid-state joining technique (metal is not melted) utilised in situations where the original metal's properties must, to the greatest extent possible, be preserved. It functions by mechanically mixing the two pieces of metal together at the joint, softening them, and then fusing them together under pressure, much like connecting clay, dough, or plasticine. The majority of the time, huge pieces that can't be easily heat treated post-weld to recover temper properties are employed in this procedure on aluminium. In December 1991, it was created and experimentally validated at The Welding Institute UK.

Light alloys like aluminium, magnesium, titanium, and their composites may now be weld much more easily thanks to friction stir welding (FSW). The enhancement in the tensile and fatigue strength of welds has been demonstrated using the very small grain size achieved by the technique, in the weld nugget, in conjunction with the high misorientation angle.

2. Working principle

As depicted in Fig. 1, a traversely fed cylindrical-shouldered tool with a profiled nib is continuously rotated and fed into a butt joint between two clamped pieces of butted material. The tool shoulder rides at the top of the work surface, and the nib is just a little bit shorter than the needed weld depth. The process two movements namely initial downward movement of tool outside the workpiece and lateral movement of the tool along the work piece.

Frictional heat is produced between the work parts and the wear-resistant welding components. The heat produced by the stirring action causes the materials to soften without melting, combined with heat from the mechanical mixing process and internal adiabatic heat. A unique design on the pin's leading face drives plasticized material to the back as it is advanced, where clamping force helps to forge the weld into place.

3. Objective of the study

The objective of the project work is as follows:

- To weld two dissimilar aluminium alloys

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Effect of thermal barrier coating of piston on the performance of diesel engine

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ABSTRACT

The principle reason for this Project is to break down the impact of clay covering on cylinder to work on the thermal proficiency alongside decrease in discharge of Engine. In this research, the outer layer of a cylinder in a diesel motor is covered with Zirconia material with profundity of 100 μm utilizing plasma-shower strategy. The temperature dispersion is in this manner broke down by Limited Component Examination strategy which is conveyed utilizing ANSYS. A trial work is led to identify the adjustment of motor qualities with the impact of practically reviewed covering material. The exploratory arrangement was developed and results were gotten for thermal effectiveness, Execution and discharges. The acquired outcomes were thought about among uncoated and Zirconia covered cylinder. Approvals between the trial and examination reports were made and the qualities were matched demonstrating the expected utilization of involving this task continuously situation. It likewise points in changing over a customary motor into a low intensity dismissal (LHR) Motor.
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1. Introduction

[1] In the event of Gas powered Motors, a large portion of the intensity created during burning cycle is consumed by cylinder. This is immediate intensity misfortune to the cylinder. This decreases Showed Power and in turns the presentation of Gas powered Motor. Motor covering with a ceramic thermal boundary can be applied to further develop dependability and strength of motor execution and productivity in diesel motors. In a customary diesel motor, around 30% of the all out energy is dismissed to the coolant and it was accounted for that the motor covering might be a decent arrangement. Principal benefits of the motor covering idea were, for example, further developed mileage, decreased hydrocarbon, smoke and carbon monoxide emanations, diminished clamor because of lower pace of tension ascent and high energy in the exhaust gases. The majority of the time, the plasma splash technique is used to apply thermal boundary coverings to the chamber head, cylinder, and valves. Additionally limiting the negative effects of wear, grinding, thermaling, erosion, and oxygenation are these parts being covered with artwork. It was likewise revealed in a hypothetical diesel cycle examination that more the intensity move diminishes, the less energy will be lost, in this way expanding the work yield and the thermal proficiency. In another review, with motor covering an expansion in motor power and decline in unambiguous fuel utilization, as well as critical decrease in fumes gas discharges and smoke thickness have been addressed in contrast with the uncoated motor. Utilizing the covered cylinder, the necessary temperature in the ignition chamber will be kept up with. This will lessen the intensity misfortune to the cylinder. This decrease in the intensity misfortune will be utilized to consume the unburnt gases there by lessening the contaminated exhaust gases.

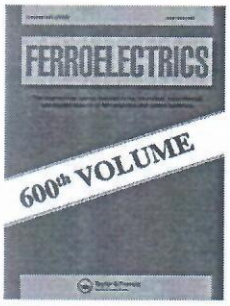
Practically tested materials are highly sought-after due to their unmatched qualities, such as resistance to oxidation, disintegration, and consumption, as well as their high hardness, synthetic strength, and thermal strength at freezing and elevated heat. Due to these characteristics, they are useful for a variety of applications, such as Temperature Barrier Cover (TBC) on metallic substrates

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Growth, optical, dielectric and mechanical studies in ferroelectric bis(methyl ammonium) tetrachlorocadmate single crystal

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Growth, optical, dielectric and mechanical studies in ferroelectric bis(methyl ammonium) tetrachlorocadmate single crystal

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ABSTRACT

The bis(methylammonium) tetrachlorocadmate (MAC-Cd) single crystal was synthesized using the slow evaporation solution growth technique at ambient temperature. The grown crystal is subjected to single-crystal X-ray diffraction, Fourier transform infrared spectroscopy (FTIR), UV–vis analysis, dielectric, and mechanical study. The presence of various functional groups was confirmed by FTIR spectrum. UV–Vis spectrum analysis was used to investigate the transparency of the crystal, and the cut-off wavelength was determined to be 235 nm. Detailed dielectric study was carried out to investigate the dielectric behaviour of the title crystal. The empirical formula was utilized to theoretically assess solid-state characteristics such as valence electron, plasma energy, Penn gap, and Fermi energy for MAC-Cd and estimated values were used to compute electronic polarizability. Vickers microhardness test was performed to measure mechanical stability and the effect of indentation size was investigated using various models.

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KEYWORDS
Solution growth; FTIR; optical properties; dielectric study; mechanical properties

1. Introduction

Hybrid organic–inorganic halide materials have recently emerged as attractive alternatives for optoelectronic applications such as photo detectors, lasers, light-emitting diodes, solar cells, and other devices [1–6]. Hybrid halides are the subject of global research and because of their electrical structures, exceptional optoelectronic capabilities, chemical compositions of crystals, and crystallinity have a wide range of functionalization. Low-dimensional hybrid organic–inorganic materials can require higher band gap energy and highly localized charges with very high exciton binding energies and reliable charge transfer emission [7,8]. Due to their outstanding performance in high-stakes situations, they are the most thoroughly used in solar cells with high efficiency.

We present a comprehensive investigation of prospective scintillator components MA_2CdCl_4, a perovskite material. X-ray diffraction of crystals, FTIR study, band

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Retrieving Images and Its Classification by Acumen Mechanism Using Texture Features

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Abstract: *The erudite software mechanism of content-based image representation and retrieval is crystal clear that it is perception-based approach. Here it main pragmatic concept is texture images and propose to model their textural concept. The main dexterous melted to estimate textural feature an namely Complexity, texture strength, coarseness, directionality, contrast, busyness and Textron. The ineffable computational measures are based on autocorrelation function (Associated with original image) An anchored comparison is taken among it statistical and structural methods of texture representation. It elicits which features given vivid performance.*

Kkeywords: Texture Classification, Statistical and Structural features, KNN classifier, Image Retrieval.

1. INTRODUCTION

Texture, which has great impact on human visual perception describe to the spatial distribution of gray-level are considered as the concept of deterministic or random repetition of one or several primitives picture form. Micro textures often have small primitives, and macro textures typically have huge primitives[7]. In the areas of classification, segmentation, and form from practical texture and picture retrieval, texture mechanism is highly helpful.There are various kinds of textural features for image classification have been proposed[1]-[3]. From a segmented region only It will defined texture measure. strategies for analysing textures The two primary giants of computation are spatial techniques and frequency-based approaches. The examination of the spectral density function in the frequency-based domain is the general foundation for our choice of frequency-based approaches. These techniques include the wavelet-based Gabor model and the acumen concept Fourier transform. Techniques for spatial texture analysis can be divided into three categories: statistical, structural, or hybrid methods.

In concerns of concept micro textures, statistical methods produce improved result, whilst structural methods produce better results in terms of concept macro textures. Whether it existing method they are statistical, structural or hybrid, have another drawback not less significant: in the computational cost.

Almost all sorts of textures were perfectly perceived by the human eye. While the automatic processing of these textures is really quite intricate, the human eye could typically perceive the variations between textures reasonably simple.

The overwhelming of computational techniques use mathematical relationships that have no perceptual meaning comprehensible by users, which is the principal reasons of the mismatch between human vision and statistical models

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Optical and piezoelectric studies of an efficient frequency doubler: Imidazolium L-Tartrate (IMLT).

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Abstract

Good quality crystal of imidazolium L-tartrate (IMLT) with a large size of 34×25×22 mm^3 has been grown by the slow cooling cum seed rotation solution growth technique. The morphology of IMLT crystal has been indexed by single crystal X-ray diffraction study which revealed the monoclinic crystal system with major forms of (0-10) and (001). Phase matching angle of IMLT was found to be 42±0.2° using a Nd:YAG laser and it was also found that the IMLT crystal belongs to type-1 phase matching category. From the piezo-electric study, the direct (d_{33}) and transverse (d_{31}) charge coefficients were calculated to be 1 pC/N and 17 pC/N, respectively.

Keywords: Crystal growth, Nonlinear optical material, Piezoelectric materials

1. Introduction

Nonlinear optical (NLO) crystals are playing an important role in the field of laser science and technology due to their potential applications such as second harmonic generation (SHG), third harmonic generation (THG), fourth harmonic generation, difference frequency generation (DFG), etc [1-3]. Some series of typical inorganic and semi-organic NLO crystals, such as potassium dihydrogen phosphate (KDP), potassium pentaborate (KB_5), β-BaB_2O_4 (BBO) and L-arginine phosphate monohydrate (LAP) have been used for second harmonic and UV generations due to their high transparency in UV-Vis region, moderate

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Exploration of third order NLO property of semi-organic optical material: Bis(L-threonine) copper (II) monohydrate [BLTCM]

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Abstract

Transparent, nonlinear Bis(L-threonine) copper (II) monohydrate [BLTCM], the semiorganic optical crystal was synthesized by a conventional slow evaporation solution growth technique. The synthesized crystals were investigated to reveals its excellent performance. The third order nonlinear optical properties of BLTCM sample in WATER was measured by the Z-scan technique using 532nm diode pumped solid state laser. This material exhibits negative optical nonlinearity. The sample at around 62 % transmittance exhibited non-linear refractive coefficient of the order of 10^{-9} (cm^2/W), nonlinear absorption coefficient of the order of 10^{-4} cm/W and nonlinear susceptibility of the order of 10^{-6} esu. These results show that BLTCM sample has potential applications in nonlinear optics.

Keywords

Solution growth ; Slow evaporation; Third order nonlinearity

1. Introduction

The search for new advanced materials is an important area of contemporary research in numerous disciplines of science and development of many new technologies. Nonlinear optical (NLO) crystals have been a great deal of interest in recent years due to their potential applications in the domain of optoelectronics and photonic technologies [1]. While the engineering for enhancing second order NLO efficiency is relatively well understood, the need for efficient third order molecules and materials still exists. Materials with third order NLO finds application in ultra-high-speed signal processing, information storage, optoelectronics and photonics, optical switching, microscopic imaging, and optical limiting applications as discussed in various literature. Organic nonlinearity, high value of molecular polarizability, molecular

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