ADDITIONAL INFORMATION

List and Evidences of Chapter, Books and Papers in Conferences

Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	Name of the publisher
1	C. P. Chaudhari and **C. M. Dudhe,** et al	--	A study of application of lever mechanisms in Yogasana and gym exercises		National conference on Applications of Science and social sciences in Sports, VasantaraoNaik Govt. Inst, of Arts and Social Sciences, Nagpur 2017	IJRBAT, ISSN:2347-517X
2	**V. M.Raut , C. M.Dudhe** , N. Dixit		Synthesis and Characterizatio n of Ppy/F19LaCl3 composites	Proceeding s of Internationa l conference on Recent trends in Science & Technology ICRTST 2018	International conference on Recent trends in Science & Technology ICRTST 2018, InnaniMahaviya lalyKaranja (Lad)	Aayushi International Interdisciplinary Research Journal (AIIRJ), ISSN: 2349-638X
3	**V. M. Raut** and PratimaDamre		Green synthesi and charaterization of New conjugated eletroluminesce ntpolyquinoline derivatives	Proceeding s of Internationa l conference on Recent trends in Science & Technology ICRTST 2018	International conference on Recent trends in Science & Technology ICRTST 2018, InnaniMahaviya lalyKaranja (Lad)	Aayushi International Interdisciplinary Research Journal (AIIRJ)ISSN: 2349-638X
4	**V. M.Raut** and S. Bangade		Synthesis of polyaniline effect of temperature and frequency of PANI-CDSO4 composite	Proceeding s of Internationa l conference on Recent trends in Science & Technology ICRTST 2018	International conference on Recent trends in Science & Technology ICRTST 2018, InnaniMahaviya lalyKaranja (Lad)	Aayushi International Interdisciplinary Research Journal (AIIRJ)ISSN: 2349-638X

5	Mr. P. D. Ashtaputreyand **S.D. Ashtaputrey**	Polymer Chemistry, Synthesis and Characterization Techniques	--	--	--	Prints Publications Pvt. Ltd.
6	S. J. Dhande**, V. M.Raut** and R. S. Futane		Synthesis and characterizatio n of modified polypyrole and TiO2 doped polypyrrole thin films by chemical bath deposition	Proceeding s of Internationa l conference on Recent trends in Science & Technology ICRTST 2018	International conference on Recent trends in Science & Technology ICRTST 2018, InnaniMahaviya lalyKaranja (Lad)	Aayushi International Interdisciplinary Research Journal (AIIRJ)ISSN: 2349-638X
7	Pratima V. Damre**, V. M.Raut**		PQ material showing characteristic properties	Proceeding s of Internationa l conference on Recent trends in Science & Technology ICRTST 2018	International conference on Recent trends in Science & Technology ICRTST 2018, InnaniMahaviya lalyKaranja (Lad)	Aayushi International Interdisciplinary Research Journal (AIIRJ)ISSN: 2349-638X

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1. **Conference paper of C. M. Dudhe**

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A STUDY OF APPLICATION OF LEVER MECHANISMS IN YOGASANA AND GYM EXERCISE

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Abstract: The three classes of levers were found to be very useful for doing yogasanas and the exercise in gym. It was found that the effects observed by adjusting the body postures in particular yogasanas are similar to that produced after performing regular gym exercise. The tension produced in the particular muscle or muscle contraction while doing the exercise improved the health of the persons performing both yogasanas and gym exercise. Both isometric and isotonic contractions of muscles were observed when yogasanas or gym exercises were performed. The seated dumbbells triceps extension, calf raises and seated dumbbells biceps curl exercise resulted in developing the triceps brachii, calf muscles and biceps muscles respectively where class I, class II and class III lever systems were used. Without any gym equipments or any other costly tools the similar benefits were observed in the persons doing yogasanas like utthit padmasana (elevated lotus posture), tadasana (palm tree pose), chaturang dandasana. Also, it was found that the yogasana exercise is more beneficial for common man in every aspect as compared to gym exercise. The profession body builders are advised to perform yogasanas along with gym exercise to get the additional benefits of yogasanas.

Keywords: Classes of lever, Gym exercise, Yogasanas, Muscle contraction

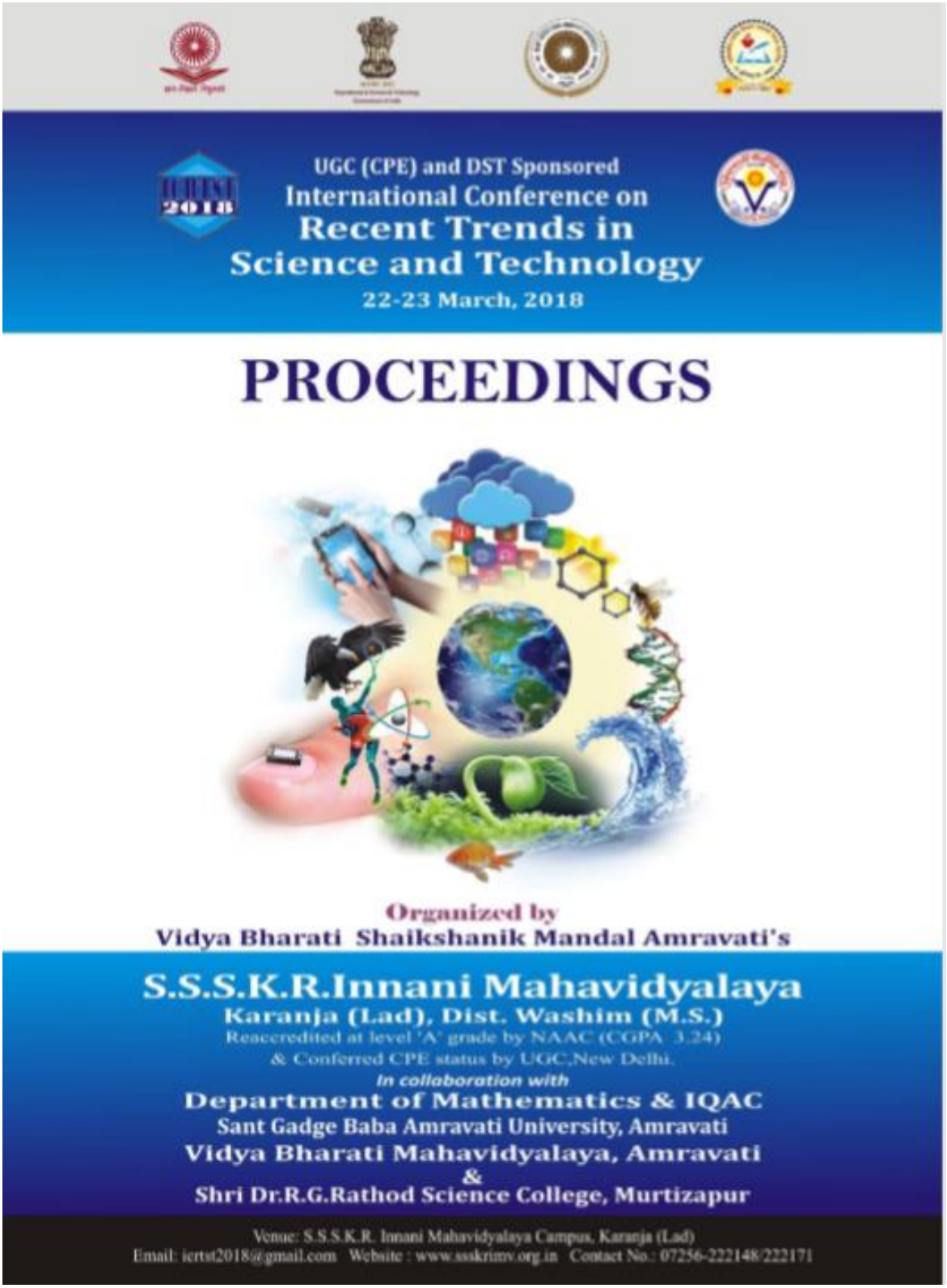
Introduction:

Fitness is the key of success for athletes. To keep fit throughout the sports carrier different exercises are regularly performed by the athletes. Every exercise is nothing but the predetermined and disciplined movements of the body parts. Looking at our body structure bones, ligaments and muscles form the levers in the body that create movements in the body parts. A lever is a device that allows you to do work by transmitting or modifying force or motion i.e. it is a simple machine that changes the direction or magnitude of a force [1] and makes the work easier for use according to principle of moment of force; it involves moving a load around a pivot using a force (effort). Archimedes discovered the principle of mechanical advantage in the lever [2]. Thus the amplification of force can be achieved by using mechanical advantage. Principle of moments of forces states that equilibrium is established when the sum of the moments of the forces acting in a clockwise direction is equal to the sum of the moments of the forces acting in a anticlockwise direction. Hence it is possible to overcome a very large force at a short distance from the fulcrum with a very small force at a large distance from the fulcrum [2]. Levers are classified according to the position of pivot (fulcrum), effort (force) and load (weight to be lifted) as given below.

Class I lever: pivot is between effort and load
Class II lever: load is between pivot and effort
Class III lever: effort is between pivot and load

A joint of bones forms the pivot, and muscles apply force to lift or push a weight (load). Most of the levers in our body are class III while number of class I and class II levers is very less. By lifting or pushing a weight by hands or legs a tension is produced in the related muscles that may change the length of the muscles depending on the type of muscle contraction. A muscle contraction is isometric if the muscle tension changes but the muscle length remains the same but, when the length of muscle changes and tension remains the same a muscle contraction is isotonic [3][4][5][6]. If the muscle length shortens the contraction is concentric but if the muscle length increases, the contraction is eccentric [3][7]. Various types of exercise using gym equipments and by doing yogasanas produce both the types of muscle

2. Conference paper of V. M. Raut



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SYNTHESIS AND CHARACTERIZATION OF PPy/$LaCl_3$ COMPOSITES

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ABSTRACT

Chemical oxidative polymerization of pyrrole (Py) was carried out by doping it with Lanthanum Chloride ($LaCl_3$) in the presence of oxidizing agent ammonium peroxydisulphate to synthesize polypyrrole/ Lanthanum Chloride (PPY/$LaCl_3$) composites. The PPY/ $LaCl_3$ composites were synthesized with various compositions of viz., 0.1 M and 0.02 M $LaCl_3$ in pyrrole. Morphological characterization of synthesized composites was carried out by SEM and powder X-ray diffraction (XRD) analysis. These studies suggest that they exhibit amorphous behavior and also show that $LaCl_3$ particles are embedded in PPy chain to form multiple phases.

Keywords: *Synthesis , characterization, X-ray diffraction, Polypyrrole*

INTRODUCTION

Over the last few decades polymers have attracted considerable interest in research for the development of advanced materials. The organic materials that generally possess an extended conjugation of Π-electron system along a polymer backbone chain are recognized as electroactive conducting polymers. These materials with interesting electron-transport behavior to a material exhibits immense potential in technological applications such as in electrochromic devices, non-linear optical system OLEDs, photoelectrochemical devices, gas sensors, biomechanical sensors.

Among the number of conducting polymers, Polypyrrole (PPy) is profoundly studied material due to its superior conductivity, good thermal and environmental stability, electrochemical reversibility, high polarizability and the ease of preparation through chemical or electrochemical routes. However, PPy is limited in practical use due to its very fragile structure and insolubility. It exhibits poor processability and lacks essential mechanical properties. These properties and applicability of polypyrrole can be improved by some suitable modifications of existing polymers structures. This can be achieved by judicious choice of making composites of PPy by doping it with suitable dopant material in order to prepare multifunctional molecular structures that open possibilities for almost any desired applications.

The association of PPY with $LaCl_3$ in order to prepare its composite which combine the properties of both materials is one very promising way to obtain the specific requirements of physical properties for each type of application.

EXPERIMENTAL

The 0.1 M solution of AR grade pyrrole was contained in a beaker which was placed in a beaker on a magnetic stirrer. 0.1 M ammonium peroxydisulphate solution was continuously added drop-wise with the help of a burette to the above 0.1 M pyrrole solution. The reaction was allowed for 6 hours under continuous stirring by maintaining a temperature of 0°C to 5°C. The precipitated polypyrrole was filtered and dried in hot air oven and subsequently in a muffle furnace at 100 °C. For 0.1 M pyrrole solution, 0.1 M solution of $LaCl_3$ was added and mixed thoroughly, further 0.06 M ammonium persulphate was continuously added drop-wise with the help of a burette to the above solution to get PPy/0.1 M $LaCl_3$ composite.similarly PPy/0.02 M $LaCl_3$ is also prepared by following the above procedure. The pure PPy and PPy/$LaCl_3$ thin films were prepared by bath deposition technique.

The synthesized composite materials were subjected to morphological studies through SEM and X-ray diffraction analysis.

RESULTS AND DISCUSSION

The XRD diffractogram of PPy and PPy/$LaCl_3$ composites is given in fig. From the X-RD analysis of the polypyrrole and PPy/$LaCl_3$ composites, it is observed that the film exhibited broad scattering peaks at 2θ value around 20-30°, which suggests that the polypyrrole and PPy/ $LaCl_3$ composites are amorphous in nature. X-ray scattering studies of polypyrrole films have been

3. Conference paper of V. M. Raut

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GREEN SYNTHESIS AND CHARACTERIZATION OF NEW CONJUGATED ELECTROLUMINESCENT POLYQUINOLINE DERIVATIVE

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ABSTRACT

The synthesis of new conjugated electroluminescent polyquinoline derivative Poly (2,2-(p-phenyl)-6,6-bis(4-phenylquinoline) [PPPQ], which are soluble in organic solvents and its incorporation in light - emitting diodes as the emissive layer are reported. These electroluminescent devices, containing 1, 1- bis (di-4-tolylaminopphenyl) cyclohexane (TAPC) dispersed in polystyrene as the hole-transport layer, emit bright yellow light (λmax =554 nm) with quantum efficiency of 0.26% photons/electron and a luminance of 280 cd/m2 at a current density of 100 mA/cm2. Electroluminescence of moderate brightness was achieved with blue-green, green, yellow, orange, and deep red colors depending on the arylene linkage of the copolymer. The thermal, electrochemical, photophysical, and electroluminescent properties of new polyquinolines varied with the arylene linkage, including p-phenylene, 4, 4-biphenylene, 5, 5-bithienylene. These results also demonstrate that the new polyquinoline is a good electron transport electroluminescent material. Large enhancement in electroluminescence efficiency and brightness of light-emitting diodes fabricated from binary blends of conjugated polyquinolines was observed compared to devices made from the homopolymers. The polymers have thermal properties with glass transitions temperature of 161-339•C. The electrical properties of the diodes and electric field modulated photoluminescence spectroscopy results confirmed that the enhancement of electroluminescence in the blends originated from spatial confinement of excitons which leads to increased exciton stability and electron hole recombination efficiency. Voltage tunable and composition –tunable multicolor electroluminescence was observed in the polymer blend devices. The observed composition dependent new emission bands and enhanced fluorescence lifetimes in the blends were suggested to originate from exciplex formation and molecular miscibility between the blend components. These results demonstrate new phenomena in the electroluminescence and photophysics of multicomponent conjugated polymers.

Keywords: *Synthesis , characterization, Electroluminescent, Polyquinoline*

INTRODUCTION

Semiconducting polymers with efficient electroluminescence are being developed for various lighting and flat-panel display applications.[1] A better understanding of the relationships of electroluminescence (EL) and photophysical properties of polymers to molecular and supramolecular structures is critical to the rational design of polymers with enhanced EL properties and device performance. Poly (p phenylenevinylene) (PPV),polythiophene (PT), poly(p-phenylene) (PPP), polyfluorene, and their derivatives have been extensively investigated as emissive materials for EL devices. Although a systematic variation of the side group attached to the polythiophene backbone has been shown to tune the EL color from blue to the near-infrared, the materials generally have very low luminescence quantum yield. PPV-based materials have high photoluminescence (PL) and EL efficiencies, and the EL color can be varied by side-chain substitutions and copolymerizations.[1] However, degradation induced by photooxidation,3 which may impede long-term device stability, is a concern with arylenevinylene polymers. Furthermore, all these extensively studied PPV-, PPP-, PT-, and polyfluorene-based EL materials are p-type semiconductors with very good hole transport but very poor electron transport properties.[1-4] Luminescent polymers with efficient electron injection and transport properties are of interest in their own right as well as to complement existing p-type polymers for the development of more efficient EL devices. Such n-type (electrons transport) polymers offer alternative EL device engineering compared to p-type polymers.[5] Here, we focus on the EL and photophysical properties of the polyquinolines which are known to be intrinsic n-type semiconducting polymers. Their n-type characteristics were revealed in previous studies

4. Conference paper of V. M. Raut

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SYNTHESIS OF POLYANILINE EFFECT OF TEMPERATURE AND FREQUENCY OF PANI-CDSO4 COMPOSITE

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ABSTRACT

Conduction of polymer is one of example of peculiar family member compounds. This compounds made of monomer unit it have conjugated double bond, After doping it carries electron. Due to this reason from commercial point of view, such polymer can replace metal and semiconductor. This present work show conductivity change of polyaniline after adding $CdSO_4$ at different temp. The electrical properties of polyaniline -$CdSO_4$ composite. Polyaniline prepared by chemical process. $CdSO_4$ disperted polyaniline composite were prepard by polymerization process. At It observed that electrical properties polyaniline such as conductivity changed by adding $CdSO_4$ with different temp. The adding of $CdSO_4$ in polymerization of polyaniline resulted in increasing molecular weight of polyaniline. Electrical conductivity of polyaniline was increased by adding $CdSO_4$ during polymerization process. Electrical conductivity study of polyaniline is also carried out know its change in properties with respect to temp. At different temperature it show change in electrical conductivity.

Keyword:- *Aniline, electrochemical polymerization, chemical polymerization , ammonium per sulfate*

INTRODUCTION

Electronic conduction and application have been reported in reviewed.[1-4] Conducting polymer is widely used in the electronic and engineering purpose because of its characteristics. It have unique properties such as electrical conductivity, mechanical strength hence it used instead of metal. Polyaniline it is good example of conducting polymer due to it properties it is used solar cell instead of platinum in solar cell. Polyanilne which can be prepared at large scale due to its physiochemical properties.[5-8] polyaniline can be prepared by oxidative and electrochemical method by using suitable oxidant and dc current. Many method available for synthesis of polyaniline .[9] They include oxidation process and Electrochemical process. But chemical oxidation method is more convenient for polymerization because its preparation method easily obtainable. So this reason polyaniline prepared in HCl medium at 0 to 10 °c by using ammonium persulphate .polyaniline composite wildly studies because their dielectric properties, dielectric, electric properties, with environmental friendly qualities polyaniline conduction properties increased 10 time than before adding compositie. [10-14]

EXPERIMENTAL

Materials

The A.R. grade aniline , hydrochloric acid, sulfuric acid, ammonium persulfate (APS) , were used, 1000 ml beaker, double distilled water, variable dc power supply were used.

METHOD OF SYNTHESIS

There are various method of preparation of polyaniline such as chemical polymerization, electrochemical polymerization method. But for composite, chemical polymerization is very useful, as compared to electrochemical and chemical polymerization both of them chemical polymerization yield is more obtained than electrochemical . All process carried out below 4°C.

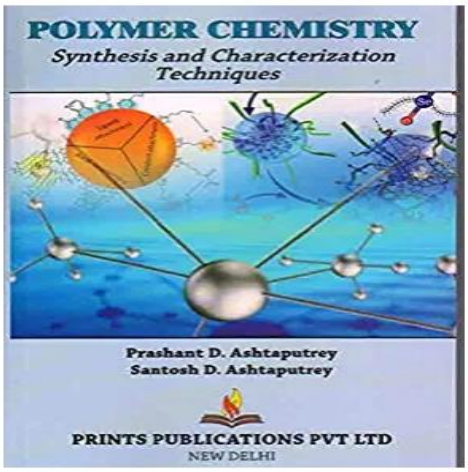
PREPARATION OF POLYANILINE

Polyaniline with $CdSO_4$ was prepared by chemical oxidation method. Whole process were carried out at 4° C. 100 ml cooled solution of 0.2 M ammonium persulphate , 1M sulfuric acid,1M hydrochloric acid were used.During the preparation of polyaniline , Double distilled water were added with sulfuric acid. APS and $CdSO_4$ added with sulphuric acid water mix slowly. Stirred for 120 min. by using magnestic stirrer at below 4° C. After some time a dark green powder was obtained, after it filtered , washed with dilute solution of dilute sulfuric acid .

5. **Reference Book by Santosh Ashtaputrey**

Prashant D. Ashtaputrey, Santosh D. Ashtaputrey

POLYMER CHEMISTRY: SYNTHESIS AND CHARACTERIZATION TECHNIQUES



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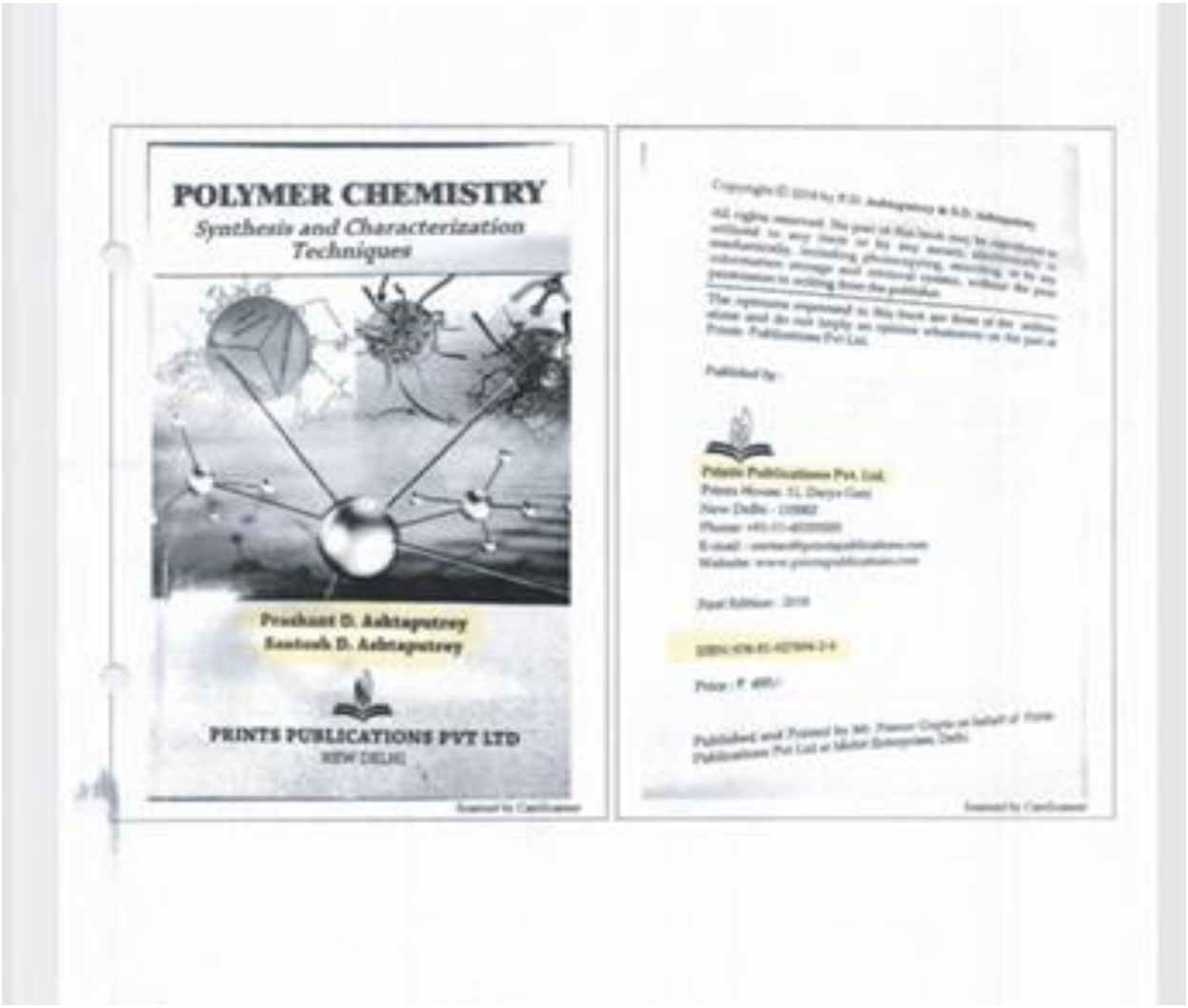

POLYMER CHEMISTRY

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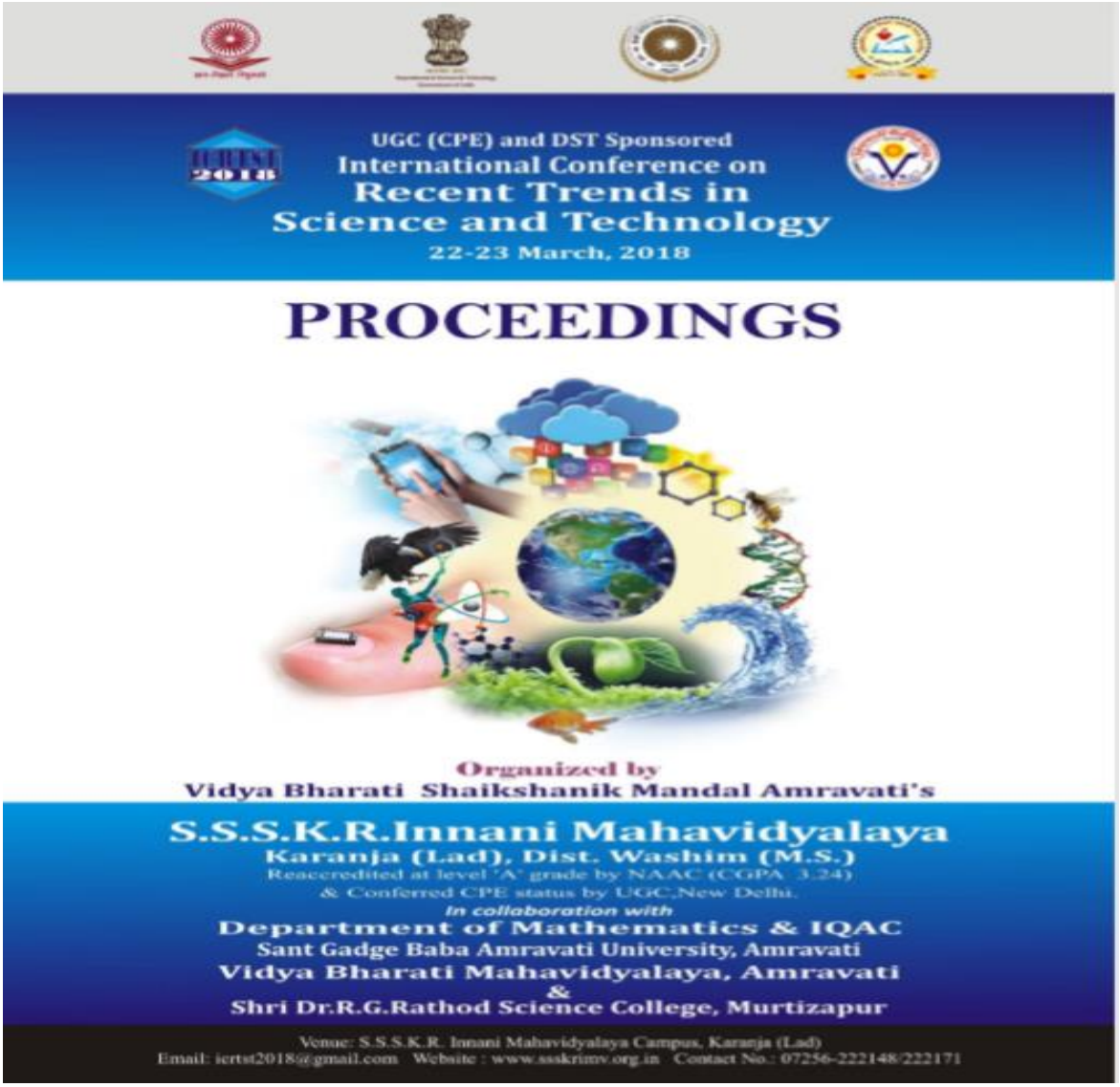
6. Conference paper of V. M. Raut



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SYNTHESIS AND CHARACTERIZATION OF MODIFIED POLYPYRROLE AND TiO_2 DOPED POLYPYRROLE THIN FILMS BY CHEMICAL BATH DEPOSITION

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ABSTRACT

The modified electroluminiscent polypyrrole thin films were deposited by chemical bath deposition technique on precleaned glass substrate by using monomer pyrrole and ammonium persulphate as an oxidant in a ratio of 1:1 with constant stirring at room temperature. The TiO_2 doped polypyrrole thin film was synthesized by using same method. During the polymerization process 1% w/v of TiO_2 was added to the solution. The effect of dopant TiO_2 on the properties of thin films were investigated. The modified undoped and TiO_2 doped polypyrrole thin films were characterized. Chemical composition is investigated by FTIR spectroscopy. Surface morphology of undoped and TiO_2 doped thin films were investigated by SEM, TEM. Thermal properties were investigated by TGA-DTA. Mass spectroscopy is studied. Electrical conductivity by four probe. Finally this study demonstrate that the conducting polymer composite thin film was successfully synthesized. The modification of polypyrrole by doping gives material high thermal stability, modified morphology enables one to avoid the low ability of polypyrrole to processing and to extend the possibilities for the development of new technical devices.

Keywords: *Polypyrrole, TiO_2, Chemical Bath Deposition, SEM, TEM, Electrical Conductivity.*

INTRODUCTION

In the polymer science, the conducting polymers have been studied extensively during the last two decades as an important semiconductor material because of their interesting chemical and physical properties [1-3]. Dopants plays an important role in conjugated polymers because these polymers become conductive when charge carriers generated by dopants are present in their structure [4].

There are lots of conjugated polymers and one of the most widely studied conjugated polymers is polypyrrole, which becomes highly conducive upon doping [5,6]. In polyheterocyclic particularly polypyrrole is one of the extensively studied electronic materials, because it exhibits relatively high electrical conductivity, good environmental stability, low toxicity and versatility of synthesis and ease of tailoring [7] to synthesize functionalized polypyrrole. The properties of polypyrrole are very sensitive to fabrication condition and to the type of preparation technique used. Therefore, study of properties of these conducting polymers with respect to different growing as well as ambient conditions is of high importance. Stability of polypyrrole in air comes from its lower oxidation potential this polypyrrole thin films have been studied by many workers, because of their special electrical properties, considerable thermal stability and oxidation resistance [8].

It has also shown that composite material always has advantages over homogeneous material. Study of polypyrrole has identified over last two decades. It has been found that much of relevant work was carried out in recent year. Many researchers have doped polypyrrole or its derivatives using $LiBF_4$, $NaAsF_6$, $NaPF_6$, Bu_4NClO_4, Et_4NBF_4, Et_4NBF_4 and iodine, LaCl.

Few researchers reported doping of derivatives of polypyrrole by using APS (Ammonium Persulphate) as an oxidant. An optical and electrical properties of polypyrrole are useful for various device applications such as in electronic and electrochromic devices. Light weight batteries, sensors, chromatographic sensory phases [9], microactuators, biosensors [10, 11], electronic windows and displays, antielectrostatic coating [12], electronic devices, packaging and functional membrane [13], optical switching devices, solid electronic capacitor [14, 15].

PPy based polymers can be used to load and release drugs delivery system [14] and biomolecules [15], biomaterials. Poloypyrrole have also been exploited in sensor applications [16].bThere are several routes for synthesis of polypyrrole thin films. The chemical bath deposition method for polypyrrole thin films is important, chemical bath deposition method (CBD) appears most suitable for integration in large scale fabrication process.

7. Conference paper of V. M. Raut

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PQ MATERIAL SHOWING CHARACTERISTIC PROPERTIES

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ABSTRACT

All the PQ derivative materials formed were investigated though FTIR, NMR spectroscopic and Mass spectrometric analysis. The thermal properties of the materials were studied by TG and DT analysis. Morphological studies of the materials were carried out through XRD, AFM and SEM studies and material is further subjected to electrical characterization by DC- conductivity measurement using Four probe conductivity instrument. The optical investigations, providing the temperature-dependent conductive defects formation in the obtained strutures.

Keywords- PQ, Conductive defects, CeCl3

INTRODUCTION

Typically, poly(quinoline)s have high thermal stability with glass-transition temperatures (Tg) above 200°C and onset thermal decomposition temperatures (Tdec) above 400°C, high oxidative stability, high electrical conductivity, and outstanding mechanical and optically clear film forming properties.[8 – 10] These characteristics make poly(quinoline)s interesting materials for electronic and/or electro-optical devices. Over the last decade, Jenekhe,Jen, and others have investigated extensively the optical and electronic properties of poly(-quinoline)s including photo-conductivity,[10] optical nonlinearity,[3 – 2] photoluminescence,[1–8] electroluminescence, [2–7] charge-transfer,[38] and electron transporting properties[7–4] for their potential applications in OLEDs,[2–3] organic photovoltaic devices,[1] and selective chemosensors (proton and metal ions).[4 – 5]

EXPERIMENTAL SECTION
MATERIAL AND METHOD

1 equiv of the diacetyl monomer, 1 equiv of 3,3-dinonanoylbenzidine, 6.0 g of diphenyl phosphate, and 3 g of *m*-cresol were added to a cylindrical reaction vessel. The reactor was purged with argon for 20 min. The mixture was mechanically stirred under static argon as the temperature was gradually raised to 140°C over a period of 12 h. The polymerization mixture was stirred at this temperature for 72 h and then precipitated into 10% triethylamine/ethanol. The precipitate was collected by vacuum filtration and extracted on a Soxhlet apparatus for 72 h with 20% triethymine/ethanol. The polymer was dissolved in CHCl3 and precipitated into ethanol, collected by vacuum filtration, and dried at 60 °C in a vacuum for24 h.

RESULTS AND DISCUSSION

Conjugated rigid-rod polyquinolines have excellent thermal stability and high mechanical strength [1,2].These *n*-type semiconducting polymers [3] have interesting electronic [2 b], photoconductive [4], and nonlinear optical [5] properties. Recently, some polyquinolines were used as both the electron-transport layer and an emission layer in polyquinoline/poly(*p*-phenylenevinylene) heterojunction light-emitting diodes (LEDs) [6]. The attractive combination of excellent thermal, mechanical, and optoelectronic properties of the conjugated polyquinolines has motivated our synthesis of new derivatives for electroluminescent device applications.

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