3.3.2 - Number of books and chapters & papers conference proceedings per teacher during the year 2017-18

Recent Developments in White Light Emitting Diodes

P.P.Lohe [1, a)] ,D.V.Nandanwar [1] P.D.Belsare [2, b)] and S.V.Moharil [3)]

[1)] *Shri Mathuradas Mohota College of Science, Sakkardara, Nagpur 440024*
[2)] *Shri Ramdeobaba College of Engineering and Management, Katol Road, Nagpur-440013*
[3)] *Department of Physics, R.T.M. Nagpur University Nagpur-440010*

[a)]Corresponding author: prachiti.lohe2012@gmail.com
[b)]belsarepd@rknec.edu

Abstract. In the recent years solid state lighting based on LEDs has revolutionized lighting technology. LEDs have many advantages over the conventional lighting based on fluorescent and incandescent lamps such as mercury free, high conversion efficiency of electrical energy into light, long lifetime reliability and ability to use with many types of devices. LEDs have emerged as a new potentially revolutionary technology that could save up to half of energy used for lighting applications. White LEDs would be the most important light source in the future, so much so that this aspect had been highlighted by the Nobel committee during the award of 2014 Nobel Prize for Physics. Recent advancement in the fabrication of GaN chip capable of emitting in blue and near UV region paved way for fabrication of white LED lamps. Mainly there are two approaches used for preparing white emitting solid state lamp. In the first approach blue light (λ=450 nm) emitted from the InGaN LED chip is partially absorbed by the YAG:Ce^{3+} phosphor coated on it and re-emitted as yellow fluorescence. A white light can be generated by the combination of blue + yellow emission bands. These lamps are already available. But they are suffering from major drawback that their Colour Rendering Index (CRI) is low.In the second approach, white LEDs are made by coating near ultraviolet emitting (360 to 410nm) LED with a mixture of high efficiency red, green and blue emitting phosphors, analogous to the fluorescent lamp. This method yields lamps with better color rendition. Addition of a yellow emitting phosphor improves CRI further. However conversion efficiency is compromised to some extent. Further the cost of near UV emitting chip is very high compared to blue emitting chips. Thus cost and light output wise, near UV chips are much inferior to blue chips.Recently some rare earth activated oxynitrides, silicates, fluorides have emerged as an important family of luminescent materials for white LED application because they can emit visible light strongly under *blue light irradiation*. These are chemically, thermally and mechanically stable materials with high efficiency to down convert blue radiation into green and red. Efficient white light can be generated by coating these phosphors on blue LED.CRI of white emitting LED lamp can be improved significantly if green and red emitting phosphors are coated on efficient blue emitting LED chips. In this approach CRI will be maintained if appropriate combination of red, green along with blue emission is used. This article reviews some recent developments in phosphors for white light emitting diodes.

INTRODUCTION

In the recent years white LED based solid-state lighting has received great attention due to the characteristics of high efficiency, simple structure, and long life. LED based lighting has many advantages over fluorescent and incandescent light sources including lower energy consumption, longer lifetime, improved physical robustness, smaller size, and faster switching. Advances in solid-state lighting (SSL) technologies have the potential to have a significant impact on energy conservation and global warming as well as providing the foundation for 21st century industries. The development of high-brightness light emitting diodes (LEDs) based on III-nitrides and AlInGaP has led to the possibility of revolutionary new approaches for lighting and general illumination. Efficient UV/blue solid state sources fabricated from III-nitrides can be coupled to phosphors for visible color and white light generation. Currently, the commonly available white LEDs are made by coating a yellow-emitting phosphor (YAG:Ce^{3+}) on a blue LED chip. However the color rendering index of this type of white LED is less than 80 and a high correlated

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Phosphor Converted White Led with Improved CRI

P. J. Yadav[1], N. D. Meshram[2], C. P. Joshi[3], S. V. Moharil[4]

[1]Kamla Nehru Mahavidyalaya, Sakkardara, Nagpur, India
[2]Shri Mathuradas Mohota College of Science, Sakkardara, Nagpur, India
[3]Physics Department, Shri Ramdeobaba K. N. Engineering College, Nagpur, India
[4]Department of Physics, R.T.M. Nagpur University, Nagpur, India
Email: yadav.pooja75@yahoo.in

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Abstract

Most of the commercial white LED lamps use blue chip coated with yellow emitting phosphor. YAG:Ce^{3+} phosphor is coated on blue chip to obtain white light. Though this is commercially successful, there are several drawbacks such as "halo effect", poor colour rendition, etc. In recent years several efforts have been made to improve LED lamp performance. In this paper modification of YAG:Ce phosphor for improving CRI, by introducing Gd^{3+}, Pr^{3+} or Tb^{3+} at Ce^{3+} site is reported.

Keywords

YAG, Phosphors, White LED, CRI and Commercial Phosphor etc.

1. Introduction

Solid state lighting based on high-brightness LEDs has emerged as a new potentially revolutionary technology that could save up to half the energy used for lighting applications. Compared with the traditional lighting, white LED has the following advantages; small (use of many kinds of associations and flexible array device), robust, long lifetime (more than 10,000 hours), low power consumption and low pollution. Thus, White LED would be the most important light source in the 21st century [1].

White LEDs, based on blue LED chips coated with a yellow emitting phosphor (YAG:Ce), were first reported in 1997 [2]. The blue chip/YAG:Ce system has many advantages. But the lamps fabricated in this manner give a poor colour rendering because the resulting light is typically deficient in the green and red colours. There are two approaches which are being followed to overcome this

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Strontium Thiogallate: An Efficient Green Emitting Phosphor for UV LEDs

N. D. Meshram[1*], P. J. Yadav[2]

[1]Kamla Nehru Mahavidyalaya, Sakkardara, Nagpur, India
[2]Shri Mathuradas Mohota College of Science, Sakkardara, India
Email: *meshramnileshsd@gmail.com

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Abstract

In this paper we have reported green emission for europium activated strontium thiogallate. The phosphor is prepared by the precipitation method followed by heating at reducing atmosphere produced by the burning charcoal and characterized using XRD, PL and EL techniques. The phosphor $SrGa_2S_4:Eu^{2+}$ gives intense green emission at 525 nm when excited by 400 nm wavelength. LEDs were also fabricated by coating europium activated strontium thiogallate on 390 nm LED chip. Intense green LEDs were obtained which can be useful for new LED applications. This phosphor can also be a prominent green component for the fabrication of white LEDs from UV diodes.

Keywords

Luminescence, Thiogallate, SSL, UV LED etc.

1. Introduction

Commercially available InGaN-based blue and green light-emitting diodes (LEDs) and laser diodes (LDs) have been successfully fabricated on sapphire or SiC substrates. [1] [2] [3] Solid state lighting based on high-brightness LEDs has emerged as a new potentially revolutionary technology that could save up to half of energy used for lighting applications. Compared with the traditional lighting, white LED has the following advantages; small (use of many kinds of associations and flexible array device), not easy to damage (bear shaking), long lifetime (more than 100,000 hours), low power consumption and low pollution. Thus, White LED would be the most important light source in the 21st century [4].

White LEDs, based on blue LED chips coated with a yellow emitting phosphor (YAG:Ce), were first reported in 1997 [5]. The blue chip/YAG:Ce system has

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Evaluation Nutrient Index by Using Organic Carbon to Determine Soil Fertility Status of Kurkheda Tahsil of Gadchiroli District, Maharashtra (India)

G. D.Satpute[1], Dr. S.B.Rewatkar[2], Dr. R. G. Gupta[3]
[1]Shree Govindrao Munghate College of Art & Science College, Kurkheda tahsil, Gadchiroli, Maharashtra, India
[2]Mohsinbhai Zaweri College, Desaiganj Wadasa, Maharashtra, India
[3]Mohata science College, Nagpur, Maharashtra, India

ABSTRACT

Soil is an important natural resource on the earth. The present paper deal with the study of evaluation nutrient index by using organic carbon and to determine soil fertility status of Kurkheda tahsil of Gadchiroli district. Spatial distributions for chemical properties were examined in the soil samples of selected agriculture fields in ten different location of Kurkheda tahsil. It is observed that soil organic carbon content of soil samples was in the range of 0.54 to 0.82 and majority of the soil samples belongs to nearly high level as per the nutrient index (2.30).

Keywords: Nutrient index, soil organic carbon, Kurkheda tahsil, soil fertility.

I. INTRODUCTION

Soil is a vital natural resource, that is nonrenewable on the human time scale and it is a living, dynamics, natural body that play money key role in terrestrial ecosystem. (Jenny 1980). The earth's soil cover is one of the main reservoirs of organic carbon in biosphere. In accordance with long –term international strategies (IPPC, 2001). It is essence of life and health for the well-being of mankind and animals and major sources of most of our food production. The maintains of soil health of soil health is essential for sustained productivity of food, the decomposition of waste, storage of heat, sequestration of carbon and the exchange of gases. However, only limited area of the soil can actually be used for growing food and when improperly managed. It can be eroded, polluted or even destroyed. (Brandy and Weill, 2000).

Historically, few former used chemicals, but maintains soil fertility by allowing long fallow period. Today, former have increased uses of chemical fertilizer and herbicides, and follow cycles have decreased or disappeared, with the continued use of the land becoming more frequent (Zhang and Zhang, 2007). Frequently, loss of productivity has been related to the loss soil organic matter (SOM) and stored nutrients that result from cultivation (Juo, et al, 1996). Hence an understanding of the distribution of the soil properties at the fields scale is important for refining agricultural management practices and assessing the effect of agricultural on environment quality (Cambardella et al, 1994). If cropping is continued over a period at a time without nutrients being restored to the soil, its fertility will be reduced and crop yields will decline poor soil fertility conceives spare plant cover, which promote erosion vulnerability. This happens becomes 90% of plants available N and S, 50-60% K, 25-30% P and almost 70% of micronutrients residue in organic matter (Stevenson, 1982).

The addition of manure, compost, fertilizer, mulch and lime. Hence, soil testing will determine the current status and provide the information regarding nutrients availability in soil which form the basis for fertility recommendation for maximizing crops yields and further to maintain optimum fertility in the soil year after year.

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Synthesis and properties of amino and thiol functionalized graphene oxide

H.P. Manwatkar [a], S.D. Gedam [a], C.S. Bhaskar [a,*], M.G. Dhonde [b], Sanjay R. Thakare [c,*]

[a] Department of Chemistry, Taywade College, Mahadula-Koradi, Nagpur 441111, India
[b] Department of Chemistry, Shri Mathuradas Mohota College of Science, Nagpur 440009, India
[c] Department of Chemistry, Govt. Institute of Forensic Science, Nagpur 440001, India

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ABSTRACT

Graphite, an allotrope of carbon, has been extensively researched in varied fields of science due to its typical structure and properties. Many researchers have transformed graphene from graphite in many ways. Functionalized graphene have immense importance because of advancement of properties for technological applications. =N– and –S– fabricated graphene oxide composite was prepared. The amino and thiol functionalized graphene oxide with improved properties is expected to adsorb heavy and toxic metals like Pb, Cd, Hg, and Ag from aqueous solutions. The synthesized composite was confirmed and characterized by various characterization techniques like FTIR, SEM, TEM and XRD.

Selection and Peer-review under responsibility of the scientific committee of the 11th National Conference on Solid State Chemistry and Allied Areas.

1. Introduction

Graphene has been researched from many aspects of superior properties such as mechanical strength, high thermal stability, and excellent electrical and photo physical properties [1–5]. Graphene has emerged as a wonder material. It is an extensively studied material as it offered many new unusual and extremely attractive properties that can be utilized for many potential applications ranging from electrochemical power sources, nanoelectronics, drug delivery, energy storage and environmental issues [6].

The reason for attraction of graphene from all the fields of science lies in its typical structure and unique properties. The properties of graphene can be more enhanced by grafting other nucleophillic species having nitrogen and sulphur containing moiety on its already existing planar, sp^2 hybridized hexagonal structure [6]. Graphite, is in the form of a stack of many layers [7], was used as a starting material to produce graphitic oxide by Hummers and Offeman [8]. Hence it is further exfoliated to single layered graphene oxide by different chemical and physical methods. The extent of oxygenation of graphitic oxide is very important in terms of its electrical conductivity which changes with the oxygen content. More the degree of oxygenation, lesser is the conductivity [8–10]. Hence to improve the electrical conductivity, the removal of oxygen from graphene oxide was carried out to get the pristine graphene like properties. Thermal, mechanical, chemical, hydrothermal and many other methods are generally carried out for the removal of oxygen functionality of graphene oxide [11]. Strong efforts are being taken to produce high quality graphene with minimum defects in structure and compatible with fabrication [12]. Many reducing agents like amino acid [9], $NaBH_4$ hydrazine hydrade, dimethyl hydrazine, aluminium powder, reducing sugars, L-Cysteine, vitamin C [12–15], and many more were used to remove the oxygen from graphene oxide chemically. Ultrasonication is another method used to remove the oxygen from of graphene oxide [16]. A. Alazami et al. [11] showed that the structural rearrangement in reduced graphene oxide does not depend only on reduction step but also on initial approach of graphitic oxidation [17]. Functionalized graphene find great application in separation and pre concentration of heavy metals [18,19]. It was reported that the carboxylic acid, carbonyl, hydroxy, epoxide functional groups which are predominantly present on the surface of graphene oxide helps in chemical modification and functionalisation. Nucleophillic attack on oxygen functionalities leave reactive groups on the surface of graphene oxide which are responsible for further chemical functionalisation [20].In this work, the reduced graphene oxide is functionalized by amino and thiol groups using 2-amino-4-phenylthiazole (2-APT).

* Corresponding authors.
E-mail address: sanjaythakareisc@gmail.com (S.R. Thakare).

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Chapter 8
Comparative Study of Dye Removal Using PANI/TiO_2 and PANI/GNS Nanocomposites

Jitendra N. Ramteke, Neha V. Nerkar and Subhash B. Kondawar

Abstract The preparation of polyaniline/titania (PANI/TiO_2) and polyaniline/graphene nanosheets (PANI/GNS) nanocomposites by *in situ* chemical oxidation polymerization is reported for the comparison of their study for the removal of methyl orange (MO) from aqueous solution. Scanning electron microscopy (SEM) and ultraviolet-visible spectroscopy (UV-VIS) have been used to analyse the nanocomposites towards their morphology and adsorption kinetics for finding the suitability of metal oxide or graphene embedded polyaniline based nanocomposites. This study is a comparison for PANI/TiO_2 and PANI/GNS towards their applicability for the removal of MO in aqueous solution. The nanocomposites of different dimensionality PANI/TiO_2 and PANI/GNS are effective to remove the MO dye by 65–70%. The results obtained from adsorption kinetics by using pseudo first order model and pseudo second order model, it is indicated that the adsorption of dye is a physical adsorption. In comparison, metal oxide incorporated polyaniline has shown better percentage of removal of dye as compared to that of graphene incorporated polyaniline.

8.1 Introduction

It is generally known that dyes are colouring materials, organic in nature and used in many industries like textile, leather industry which are the major causes of environmental pollution. The textile industry uses excessively the various dyes which lead to severe pollution for the surface water causes contamination in groundwater due to release of toxic and colored effluents [1, 2]. Due to non-degradable and water soluble properties of most of the dyes, it is difficult to remove them from water once released into water from the textile industries. For the removal of dyes from the water, the

J. N. Ramteke
Department of Physics, Mohata Science College, Nagpur, India
e-mail: ramtekejitendra@yahoo.com

N. V. Nerkar · S. B. Kondawar (✉)
Department of Physics, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, India
e-mail: sbkondawar@yahoo.co.in

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$K_2GeF_6:Mn^{4+}$ phosphor for improving performance of CdS-CdTe solar cells

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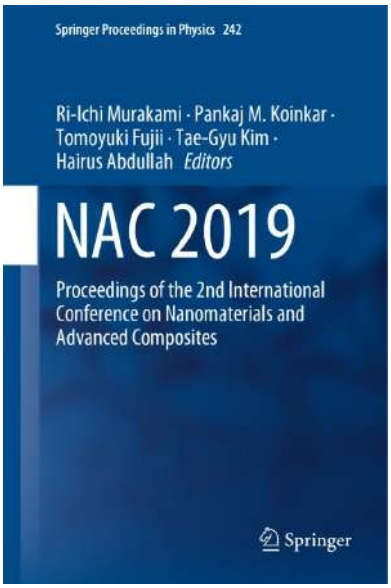
P. P. Lohe, D. V. Nandanwar, P. D. Belsare, and S. V. Moharil



Chapter 3
Electromagnetic Interference Shielding Effectiveness of Graphene Based Conducting Polymer Nanocomposites

Prerna R. Modak, Deoram V. Nandanwar and Subhash B. Kondawar

Abstract Carbon-based conducting polymer nanocomposites were found to be an excellent electromagnetic interference (EMI) shielding materials. In the present work, initially the graphene was functionalized by acid treatment to attach carboxylic functional groups on the surface of the graphene to facilitate the interaction with conducting polymer. Polyaniline (PANI)/Graphene (GNS) and polypyrrole (PPy)/Graphene (GNS) nanocomposites were synthesized by in situ chemical oxidative polymerization and characterized by SEM, FTIR and UV-VIS analyses. The electrical conductivity of nanocomposites was found to be drastically increased as compared to that of pure conducting polymer. Further, the conductivity of nanocomposites was also found to be increased with the increase in weight % of GNS. Nanocomposites showed semiconducting nature as that of pure conducting polymer with improved dielectric properties and EMI shielding effectiveness. The EMI shielding effectiveness (SE) of nanocomposites was found to be increased with increasing GNS content. The dominant mechanism of EMI shielding for both PANI/GNS and PPy/GNS nanocomposites is absorption and thus, the nanocomposites can be used as EMI shielding materials to protect electronic devices and components from electromagnetic radiation. The comparative study infers that the shielding effectiveness of PPy/GNS nanaocomposites is less than that of PANI/GNS nanocomposites.

Chapter 9
Electrospun Eu(TTA)$_3$Phen/Polymer Blend Nanofibers for Photoluminescent Smart Fabrics

Manjusha P. Dandekar, Sangeeta G. Itankar, Deoram V. Nandanwar and Subhash B. Kondawar

Abstract Here, we report an innovative electrospun composite nanofiber having a complex of Eu(TTA)$_3$Phen doped in a matrix of polymer blends prepared by electrospinning for designing smart fabrics. Europium complex Eu(TTA)$_3$Phen contains 2-thenoyltrifluoroacetone(TTA), 1,10-phenanthroline(Phen) and europium. It was synthesized by co-precipitation technique for the preparation of electrospun nanofibers of Eu(TTA)$_3$Phen/polymer blends such as Eu(TTA)$_3$Phen/PVDF-PMMA(Polyvinylidene fluoride-Polymethylmethacrylate) and Eu(TTA)$_3$Phen/PVDF-PS(Polyvinylidene fluoride-Polystyrene. Nanofibers of Eu(TTA)$_3$Phen/polymer blends were characterized by Scanning Electron Microscopy (SEM), Fourier Transform Infra Red (FTIR), X-ray diffraction (XRD) and Photoluminescence (Pl). Photoluminescence study of the nanofibers shows red emission which is allocated to the transitions between the first excited state ($^5D_0$) and the multiplet states ($^7F_{0\text{-}4}$). Due to the integration of Eu(TTA)$_3$Phen complex into the polymer matrix and subsequent distortion of the symmetry around the Eu^{3+} ions by the chapping Polymer, the polarization of the Eu^{3+} ions was improved, which increased the probability for electronic dipole allowed transitions. The Judd-Ofelt theory was used to calculate intensity parameters from emission data of Eu(TTA)$_3$Phen/polymers blends. As compared to PS and PMMA, presence of PVDF in both polymer blends generally increases the intensity of hypersensitive transition and perhaps is responsible for enhancement of photoluminescence properties. Electrospun nanofibers of Eu(TTA)$_3$Phen/PVDF-PS and Eu(TTA)$_3$Phen/PVDF-PMMA can be important candidate for designing photoluminescent smart fabrics.

M. P. Dandekar · S. G. Itankar · S. B. Kondawar (✉)
Department of Physics, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, India
e-mail: sbkondawar@yahoo.co.in

M. P. Dandekar
e-mail: manjusha.dandekar@gmail.com

D. V. Nandanwar
Department of Physics, Mohata Science College, Nagpur, India

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Synthesis and photoluminescence study of electrospun nanofibers of $Eu(TTA)_3Phen$/PMMA-PVDF composite for photoluminescent fabric designing

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Manjusha Dandekar, Sangeeta Itankar, Subhash B. Kondawar, and D. V. Nandanwar

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A Prominent Overlapping of Red Phosphor Emission with the Absorption Spectra of Green Plants Useful for Artificial LED Plant Lighting

P. J. Yadav*[1], N. D. Meshram[2], S. V. Moharil[3]

*[1]Jawaharlal Nehru Aluminium Research Development and Design Centre, Wadi, Amravati road, Nagpur, Maharashtra, India

[2]Shri. Mathuradas Mohota College of Science, Sakkardara Square, Nagpur, Maharashtra, India

[3]Department of Physics, R.T.M. Nagpur University campus, Nagpur, Maharashtra, India

ABSTRACT

Horticultural lighting allows for year-round cultivation of vegetable crops independent of weather conditions or season of the year. Certain living organisms, such as plants and algae, cannot directly process the energy gathered from solar radiation. Instead, it has to be first converted into chemical energy. This process is called photosynthesis and it is one of the oldest, most abundant and perhaps most important biochemical processes on Earth. During photosynthesis, the incident solar energy is converted into chemical energy used for the growth and development of plants.

Artificial light sources were used to grow plants before the invention of incandescent lamp, with some of the earliest reports in the year 1861. The use and usefulness of incandescent lamps in horticultural lighting has been limited. The reasons are the low electrical efficiency, low light emission, unbalanced spectrum (reduced emission in the blue region) and short lifetime.

Conventional light sources cannot be spectrally controlled without the inefficient and limited utilization of additional filters. The LED does not suffer from these limitations. LEDs have emerged as a potentially energy-efficient, viable and promising technology for use in horticultural lighting. The use of LEDs in plant production applications offers completely novel opportunities for optimization of plant growth and development that can be achieved through more versatile and appropriate control of the quantity, periodicity and spectrum of the light provided. This optimization can be tailored to the specific needs of each crop species and their production conditions.

In this paper we reported the red emitting phosphor CaS: $Eu2^{+}$ with good overlapping in the photosynthetic and photo morphogenetic receptors absorption spectra of green plants. It can be a promising candidate for coating on the 410 nm LEDs to get emission in the range 300-400 and 600-700 nm.

Keywords : Horticulture lighting, LEDs, absorption spectra, plant growth.

I. INTRODUCTION

It is well known that light is one of most important influence factors for plant growth because it plays an important role in normal growth and development of plants [1]. The natural rhythms of the plant can be controlled by light because light is acted as rapid and reversible molecular switches. The blue light (400-

Design of a Low Cost Solar Simulator by using Light Emitting Diode (LED)

N. D. Meshram[1,a] and P. J. Yadav[2,b]

[1]Shri. MathuradasMohota College of Science, Sakkardara Square, Nagpur-440009, India.
[2]Department of Electronics, R. T. M. Nagpur University Campus, Nagpur-440003, India.

[a]Corresponding author: meshramnileshsd@gmail.com
[b] yadav.pooja75@yahoo.in

Abstract. Solar simulators based on light emitting diodes (LEDs) have shown great promise as alternative light sources for indoor testing of PV cells with certain characteristics that make them superior to the traditional solar simulators. However, large-area uniform illumination, more suitable for larger cells and module measurements still remain a challenge today. In this paper, we discuss the development and fabrication of a scalable large-area LED-based solar simulator that consists of multiple tapered light guides. We demonstrate fine intermixing of many LED light rays and power delivery in the form of a synthesized air mass (AM) 1.5 spectrum over an area of 25 cm by 50 cm with better than 10 % spatial no uniformity. We present the spectral output, the spatial uniformity and the temporal stability of the simulator in both the constant current mode and the pulsed-mode LED operation, and compare our data with the International Electro technical Commission (IEC) standards on solar simulators for class rating. Although the light intensity with our current design and settings falls short of the standard solar AM 1.5intensity, this design and further improvements open up the possibility of achieving large-area, high power indoor solar simulation with various desired spectra.

1. Introduction

Solar simulator produces the operating conditions which are necessary for the solar cell to work. Hence a solar simulator is called as a fundamental instrument to make the characterization of the solar cell. These systems are basically big, bulky, and costly but a small solar simulator can be a good contribution to test small device manufactured in research scale. But the designed solar simulator should be covering the entire irradiation wavelength. The solar cell can be illuminated by solar simulators during the properties measurement like I-V [1] curves, external quantum efficiency, or electrochemical impedance. The existing solar simulators which uses tungsten filament or xenon lamps as the source of illumination, has more limitations [2,3], like only the spectral irradiance of the solar spectrum can only be marginally approximated. Also the Xe lamp shows more strong variations in intensity from near UV to NIR [2]. The standard for solar simulator is provided by International Electrotechnical Commision (IEC) or American society for testing of PV cells. The light output from a sun simulator must give calibrated spectral content, temporal stability and irradiance spatial uniformaity. These characteristics of the simulator provides different classes of the sun simulator [4,5].

Enhanced electromagnetic interference shielding effectiveness of carbon-based conducting polymer nanocomposites

P Modak[1] and D Nandanwar[2]
[1]Rashtrapita Mahatma Gandhi Arts, Commerce and Science College,
Saoli, Chandrapur, India
prm5101979@gmail.com
[2]Shri Mathuradas Mohota Science College, Nagpur, India
deoram.nandanwar@yahoo.co.in

Abstract. Carbon is always a fascinating material, the allotropes of carbon family like fullerenes, graphite, graphene , carbon nanotubes and various fillers that improves the Electromagnetic interference (EMI) shielding is of large interest in various frequency band. In the present work, initially Multiwalled Carbon Nanotubes (MWCNT) and Graphene (GNS) were functionalized to improve the interaction of conducting polymer. Polyaniline (PANI)/(MWCNT) and Polyaniline (PANI)/(GNS) were synthesized by in situ oxidative polymerization method and then characterized by SEM analysis. The electrical conductivity of the nanocomposites increases with increase in weight percent of CNT or GNS as compared to pure polyaniline. The carbon based conducting polymer nanocomposites showed semiconducting nature with enhanced EMI shielding effectiveness. The EMI Shielding effectiveness (SE) of carbon based conducting polymer nanocomposites increases with increase in weight percent of CNT or GNS. For both the nanocomposites PANI/MWCNT and PANI/GNS absorption is the mechanism which is dominant which can be used as an Electromagnetic Interference Shielding material.

1.Introduction

The rising requirement of high standard of electronic and communication devices in various fields of military, industry, and commercial applications led to compactness of electronic devices and systems this increases the complexity of the circuit. This offers a new kind of challenge that makes us to make a lot of efforts to come up with, that is the electromagnetic radiation. These electromagnetic radiations interfere and may harm the system, which is called electromagnetic (EM) pollution. Electromagnetic Interference is a severe basis of concern as it affects the activity of a device or transmission channel. The progress of a range of materials for electromagnetic interference (EMI) shielding applications has been initiated by the scientific and research communities to overcome this problem. For this several materials, such as metals, carbon derivatives and polymer nanocomposites, have been extensively explored recently. Polymer based nanocomposite shielding materials are beneficial over the usual metal based shielding owing to its low density, corrosion resistivity and simple processability [1]. The tunable dielectric and magnetic attributes, light weightless and low cost of conducting polymer-based composites gained the huge importance as EMI shielding materials. The properties can promote additional modification by varying nature of dopant, by merging comonomers or by controlling reaction conditions. Among the conducting polymer PANI has special status due to its non-redox doping property, superior environmental steadiness and economical practicability [2]. Now, a day polymer research is exploring the synergetic outcome of nano reinforcement in improving the range of properties of polymers. Carbon derivatives, among various nano reinforcement, shows a potential substitute for reinforcing polymers due to its exceptional mechanical properties, heat

Flux Assisted Synthesis of $Ba_9Sc_2Si_6O_{24}:Eu^{2+}$ Phosphor

P.P. Lohe[1, a)], D.V. Nandanwar[2, b)], P.D. Belsare[3, c)], and S.V. Moharil[4, d)], S.P. Wankhede[5, e)], A.M. Badar[6, f)]

[1]*Jhulelal Institute of Technology, Off Koradi Road, Nagpur, 441111, India.*
[2]*Department of Physics, Shri M.M. College of Science, Sakkardara Nagpur, 440009, India.*
[3]*Shri Ramdeobaba College of Engineering and Management, Katol Road, Nagpur 440013, India.*
[4]*Department of Physics, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur 440033, India.*
[5]*Department of Physics, K.D.K. College of Engineering, Nagpur,440009, India.*
[6]*Department of Civil Engineering, K.D.K. College of Engineering, Nagpur,440009, India.*

[e)]Corresponding author: spwankhede20@gmail.com
[a)]prachiti.lohe2012@gmail.com
[b)]deoram.nandanwar@yahoo.co.in
[c)]pankajbelsare@gmail.com,
[d)]sanjivmoharil@gmail.com
[f)]am1_badar@yahoo.com

Abstract: $Ba_9Sc_2Si_6O_{24}:Eu^{2+}$ phosphors have been reported to acquire several desired properties such as emission and excitation spectra, thermal stability, etc. needed for phosphor converted LED. Solid state reaction has been invariably used to prepare these phosphors. Synthesis at temperatures as high as 1450 ^{0}C was required to prepare these phosphors in all previous studies. It is shown that use of flux can bring down the synthesis temperature to 1100 ^{0}C. The phosphors so prepared had luminescence properties comparable with those reported in the literature.

INTRODUCTION

While attempting synthesis of transparent silicate materials, Wang et al. discovered $Ba_9Sc_2Si_6O_{24}$ and found that it had a structure different than that of garnet [1]. The structure is suitable for luminescence studies due to availability of variety of sites where activator ions can be accommodated. There are both trivalent and divalent sites. Moreover, the divalent sites are of three types, with 9, 10 and 12 coordination. Notwithstanding such attractive features, it took more than a decade before luminescence in this host was studied [2]. Intense green emission which could be excited by blue light was observed in $Ba_9Sc_2Si_6O_{24}:Eu^{2+}$, and hence it was proposed to use this phosphor as a green emitting component for white LED based on blue chip. Moreover, partial nitridition was found to shift the emission to yellow region, and it was suggested as a replacement for YAG:Ce. During the next decade, and particularly in last 2-3 years, there had been rapid progress in research related to luminescence in this and related hosts. Bian et al. [3] observed that the green emission could be tuned by partially replacing Ba with Sr. However, this comes at the cost of intensity. Later Kim et al. found that Sc could be totally replaced by Yttrium, and a new host $Ba_9Y_2Si_6O_{24}$ was suggested for Eu^{2+} activator [4]. This has same structure as that of $Ba_9Sc_2Si_6O_{24}$, and similar green, Eu^{2+} emission [5]. This is more preferable host as use of Yttrium is much more economic than Sc. Nitridition was found to increase the thermal stability of the emission, besides inducing a small red shift in both the excitation and emission [6]. Ce^{3+} is another lanthanide activator which shows intense d-f emission from allowed transitions similar to that of Eu^{2+}, but usually at shorter wavelengths. Such emission was indeed observed in $Ba_9Sc_2Si_6O_{24}:Ce^{3+}$ [7]. PL characteristics could again be tuned by substituting Sr for Ba [8]. In this case intensity also increased after Sr addition. Ce^{3+} emission was studied in $Ba_9Y_2Si_6O_{24}$ host as well [9]. With emission around 490 nm and excitation

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3.3.2 - Number of books and chapters & papers conference proceedings per teacher during the year 2021-22

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Ionic conductivity study of Camphor Sulphonic Acid doped PMMA-PVC blends as polyelectrolyte

Vijay V. Soman [a,*], Vaishali V. Soman [b], D.S. Kelkar [c]

[a] Physics Department, S. M. Mohota College of Science, Nagpur 440009, India
[b] Department of Applied Physics, Priyadarshini College of Engineering, Nagpur 440019, India
[c] Physics Department, Institute of Science, Nagpur 440001, India

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ABSTRACT

Blends of PMMA and PVC were synthesized using film cast and doped with Camphor Sulphonic Acid (CSA). In order that the mechanical properties do not deteriorate, plasticizers were not added. The amorphous nature of the doped samples was confirmed through XRD and ac electrical conductivity of these blends was studied as a function of frequency in the range 100 Hz to 1 MHz at eight different temperatures from 30 °C to100 °C. The nonlinearity observed indicates that the ion transport in polymer electrolyte is dependent on polymer segmental motion. The slight increase in conductivity with temperature was due to the hopping mechanism between the coordinating sites and the linear variation of conductivity with frequency for all the temperatures and the samples and was attributed to the polarization of electrodes.

Selection and peer-review under responsibility of the scientific committee of 2022 International Conference on Recent Advances in Engineering Materials.

1. Introduction

Research and development in polymer electrolytes is of great technological interest due to their application as solid electrolyte in various electrochemical devices such as batteries, fuel cells, photo-chemical solar cells, super- capacitors, sensors, etc. [1]. There are many individual polymers like poly(acrylonitrile)(PAN), poly(propylene oxide) (PPO), PMMA, poly(maleic anhydridestyrene) which have been tried for their use as polyelectrolytes amongst which the most extensively tried one is poly (ethylene oxide) (PEO) [2]. PEO was mostly added with inorganic salts like $LiClO_4$, $LiBF_4$, $Mg(NO_3)_2$, $LiCF_3SO_3$, KI, $NaClO_3$, $LiPF_6$, etc. [2]. They were known as the first generation solid polymer electrolytes (SPE) [1]. However their drawback was that the satisfactory ionic conductivity could be obtained only above the melting temperature of PEO where PEO becomes amorphous [1,3]. Below this temperature it was thought that due to high degree of crystallinity of PEO, the conductivity reduces [1,2]. Therefore attempts were made to reduce the crystallinity of PEO at ambient temperature. This attempt gave rise to the second generation SPE in which low molecular weight plasticizers with high dielectric constant were incorporated into the polymer matrix[1]. Though the plasticizers help in increasing the ionic mobility, thereby enhancing the ionic conductivity, they decrease the mechanical strength of electrolyte system. This effect is pronounced when the degree of plasticization is high [4]. Therefore the use of inorganic fillers was tried to improve the electrochemical and mechanical characteristics of second generation SPE which gave rise to third generation SPE [2].

The various methods for improving the mechanical, electrical properties of polymer electrolytes are the use of crosslinking agents, use of grafts, blending, block copolymerization, etc. [5]. Among the other methods, blending is relatively an easy method as far as preparation and control of physical properties is concerned. Therefore a number of polymer pairs have been investigated for their possible application as blend polyelectrolyte. Such as poly (vinyl chloride)-poly(ethyl methacrylate) based with propylene carbonate as a plasticizer and $LiBF_4$, $LiClO_4$, $LiCF_3SO_3$ as salts have been studied by Rajendran et al. [6] where the authors have reported maximum ionic conductivity ($\sim 10^{-3}$ S/cm) for $LiBF_4$ salt and thermal stability up to 254 °C. Baskaran et al. [5] have studied PVAc-PMMA blend electrolyte system with $LiClO_4$ as a dopant (20 wt%) and have proposed this blend polymer complex as a good candidate for lithium rechargeable battery. But the

* Corresponding author.
E-mail address: vvsoman@mohotasci.edu.in (V.V. Soman).

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Different Information Communication Technology Based Projects and Its Consequence on Students Performance in Higher Education

Sudhir B.Agarmore[1], Dr. Hemant S. Mahalle[2]

[1]Department of Computer Science, Shri Mathuradas Mohota College of Science, Nagpur, Maharashtra, India
[2]Principal, Shri Vitthal Rukhmini College, Sawana, Ta- Mahagaon, Dist- Yavatmal, Maharashtra, India

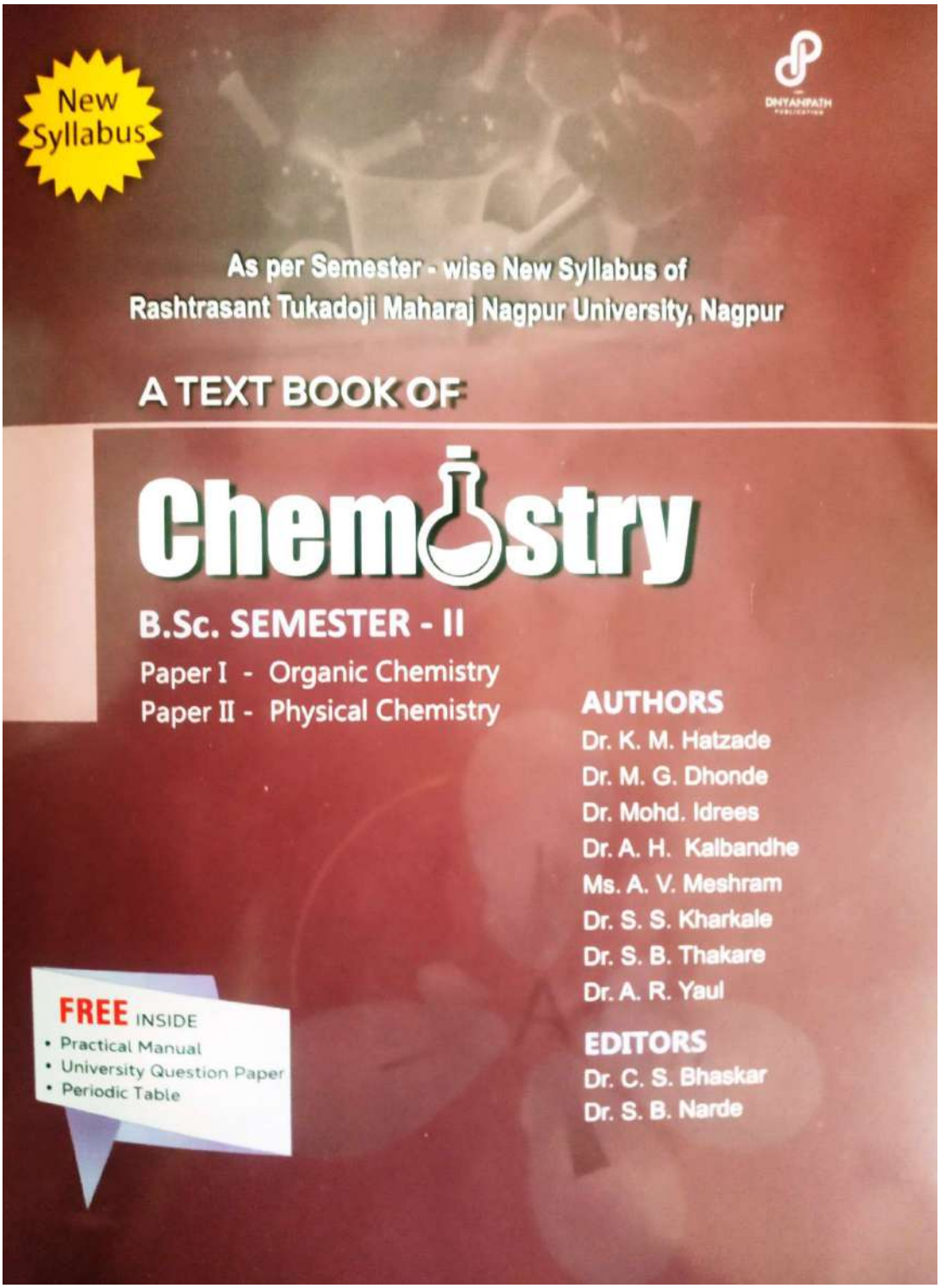
ABSTRACT

ICT refers to technologies that enable telecommunications access to information. It is comparable to IT but mostly focuses on communication technology. In India, education has been aggressively pushed via the application of Information and Communication Technologies (ICTs). Using single way and interactive television, from radio to satellite India has tried and has successfully extended education to backward places. India has extensive expertise in both formal and informal education with broadcasting and digital technology. Various more digital technology-based initiatives in different parts of India have been implemented. Technology used in the name of education is not the goal of education, but rather an aid to it. The use of technology, which is one of the most powerful parts of the information age, encumbers individuals in order to strengthen citizens and occupation members in the face of events and concepts, as well as to simplify their daily routines. India now aspires to be a leader among knowledge-based societies, and it is working hard to achieve this goal. We can say that at this point in time, information and communication technology (ICT) has an impact on every element of human life. They play important roles in the workplace, in business, in education, and in the entertainment industry.

Keywords: Higher, Education, Information Communication Technology, Project, Student, etc.

I. INTRODUCTION

ICT stands for "Technology of Information and Communication." It refers to technologies that enable telecommunications access to information. It is comparable to IT but mostly focuses on communication technology. The Internet, the Wi-Fi networks, communication Telephones and other media this means that in the course of the teacher training, we now have more opportunity to use ICT and to increase teacher quality efficiently. According to United Nations, the "ICT" discipline and management information utilized for the processing, implementation and association of social, economic and cultural data is scientific, technological and engineering." "Teacher is the most educational aspect of our society's education. He works more in every field to better our society. Skilful teachers can use the form of a good social worker, politician, poet, philosopher for society for creative students. Professors can perform with the learner a friendly role. The quick technological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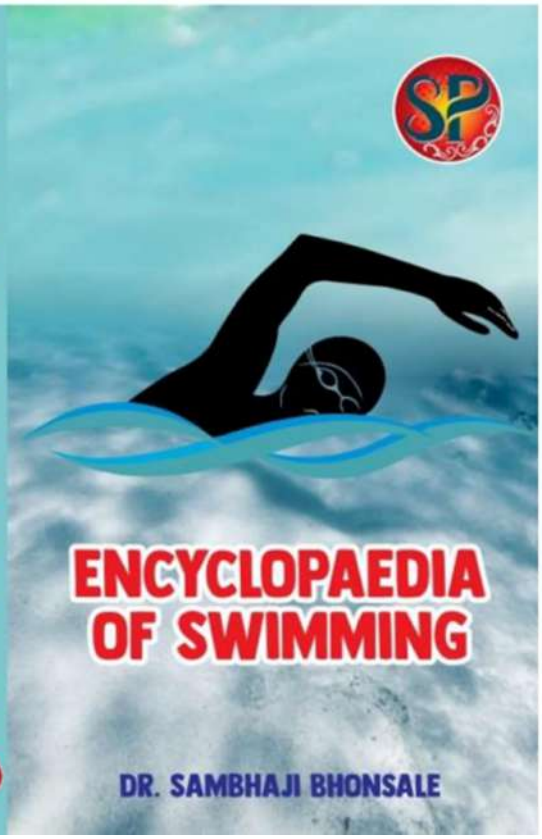

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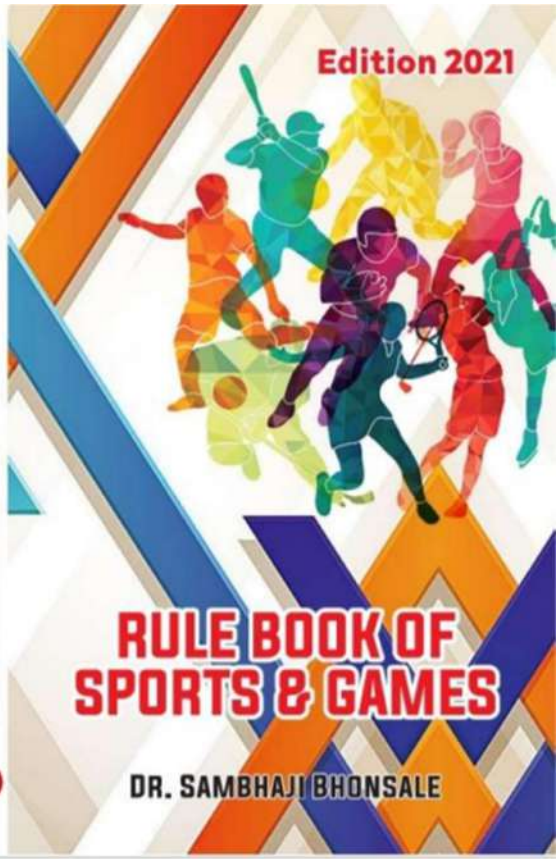

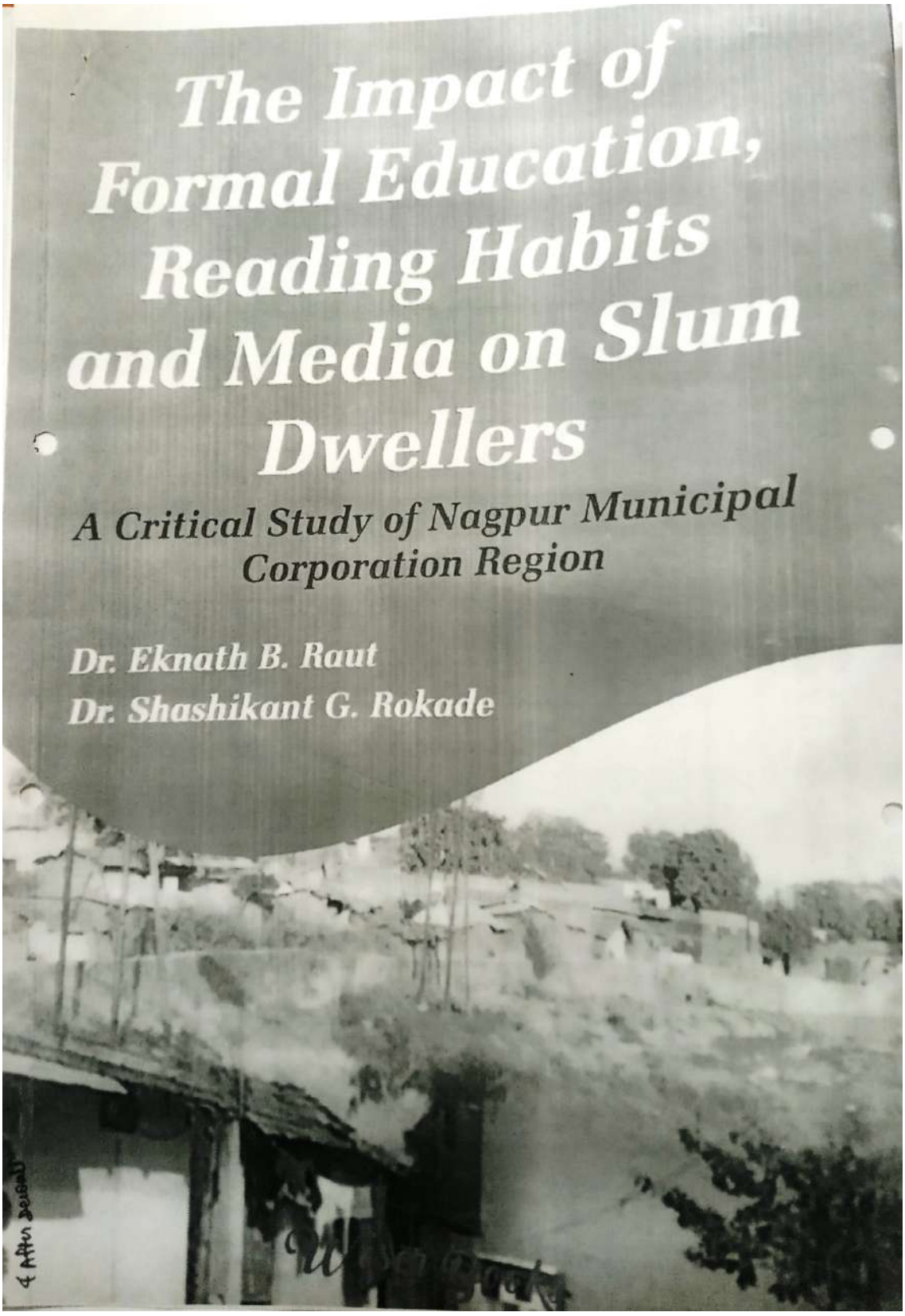
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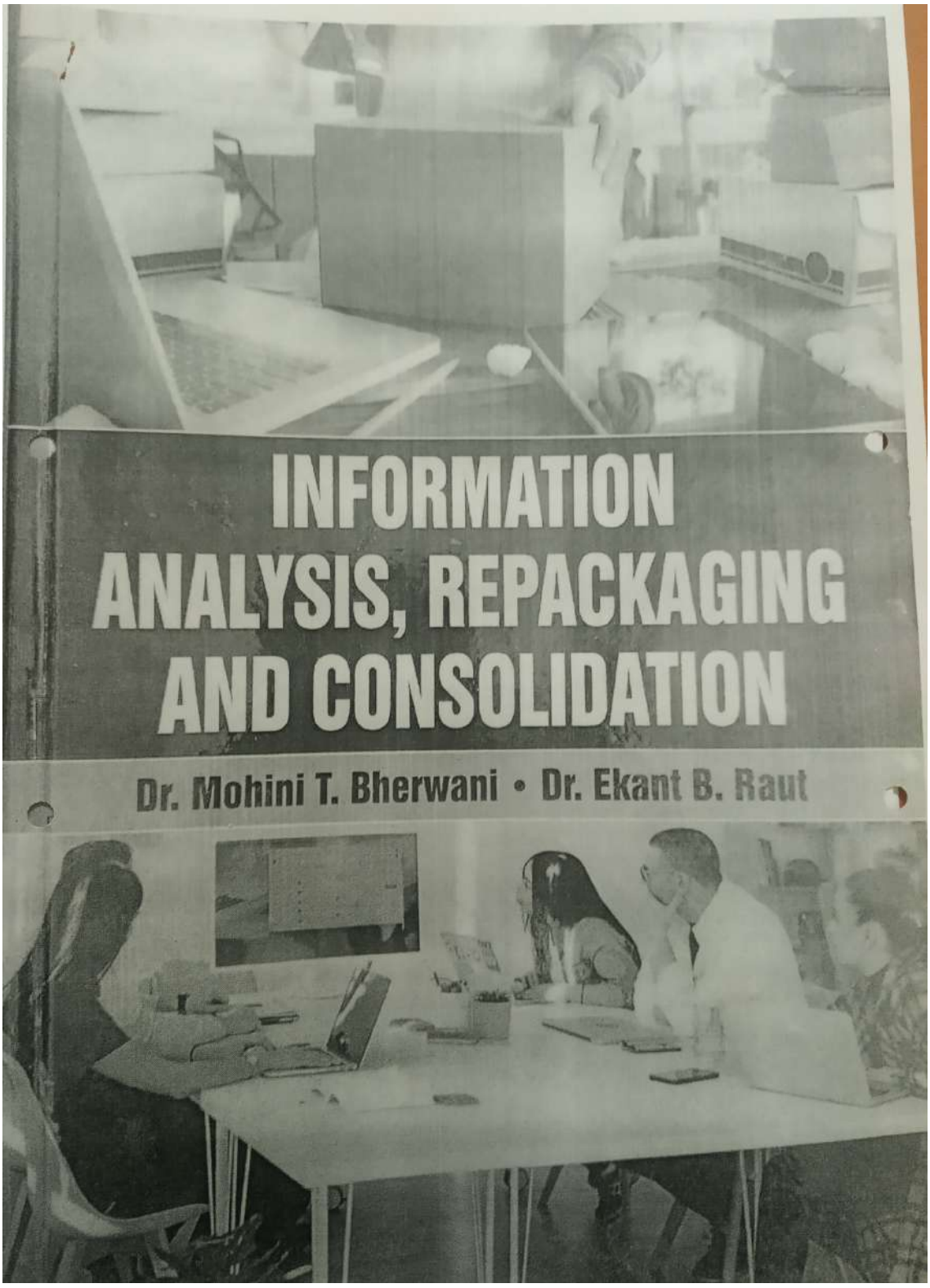
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About the Author

Dr. Mohini T. Bherwani has MA (ELT), MLISc, NET, Ph.D. degree. She is presently working as Librarian in Shri Binzani City College, Nagpur, Maharashtra since 15 years. She has completed her BLISc and MLISc from Nagpur University with 1st position in the university and has been awarded gold medal for it. She was awarded Ph.D. in "Metadata in Open Access Context: A Critical Study" from Nagpur University in 2011. She has written five books and written chapters for various books. She has written research article in a number of national and international journals. She has also worked in Chirayu K. C. Bajaj College of Education, Nagpur as librarian and Joshi College of Library and Information Science as CHB teacher.

Dr. Eknath B. Raut has M.Com, MA (Economics), MLISc., NET, Ph.D. degree. Dr. Raut is working as librarian in Shri Mathuradas Mohota Science College, Nagpur since last 22 years. Previously he was working with Mumbai University. He is the alumni of Deptt. Of library and Information Science, RTM Nagpur University. He has a number of research papers in national and international journals to his credit.

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About The Book

Information analysis has been carried out by scholars at least as early as the time of the Abyssinian Empire with the emergence of cultural depositories, what is today known as libraries and archives. Institutionally, information science emerged in the 19th century along with many other social science disciplines. As a science, however, it finds its institutional roots in the history of science, beginning with publication of the first issues of Philosophical Transactions, generally considered the first scientific journal, in 1665 by the Royal Society (London).

The institutionalization of science occurred throughout the 18th Century. In 1731, Benjamin Franklin established the Library Company of Philadelphia, the first library owned by a group of public citizens, which quickly expanded beyond the realm of books and became a center of scientific experiment, and which hosted public exhibitions of scientific experiments. Benjamin Franklin did invest a town in Massachusetts with a collection of books that the town voted to make available to all free of charge, which formed the first Public Library.

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