3.3.3. Total number of books and chapters in edited volumes/books published and papers in national/ international conference proceedings year wise during year

Sr. No.	Author	Paper	Book
1	Dr. D.V. Nandanwar	JPG image given below	NIL
2	Dr. D.V. Nandanwar	JPG image given below	NIL
3	Dr. Nilesh D. Meshram	JPG image given below	NIL
4	Dr. Nilesh D. Meshram	JPG image given below	NIL
5	Dr. P. U. Gajbe	NIL	JPG image given below

Conference publications

Dr. D. V. Nandanwar

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

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

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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

Dr. N. D. Meshram

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

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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)

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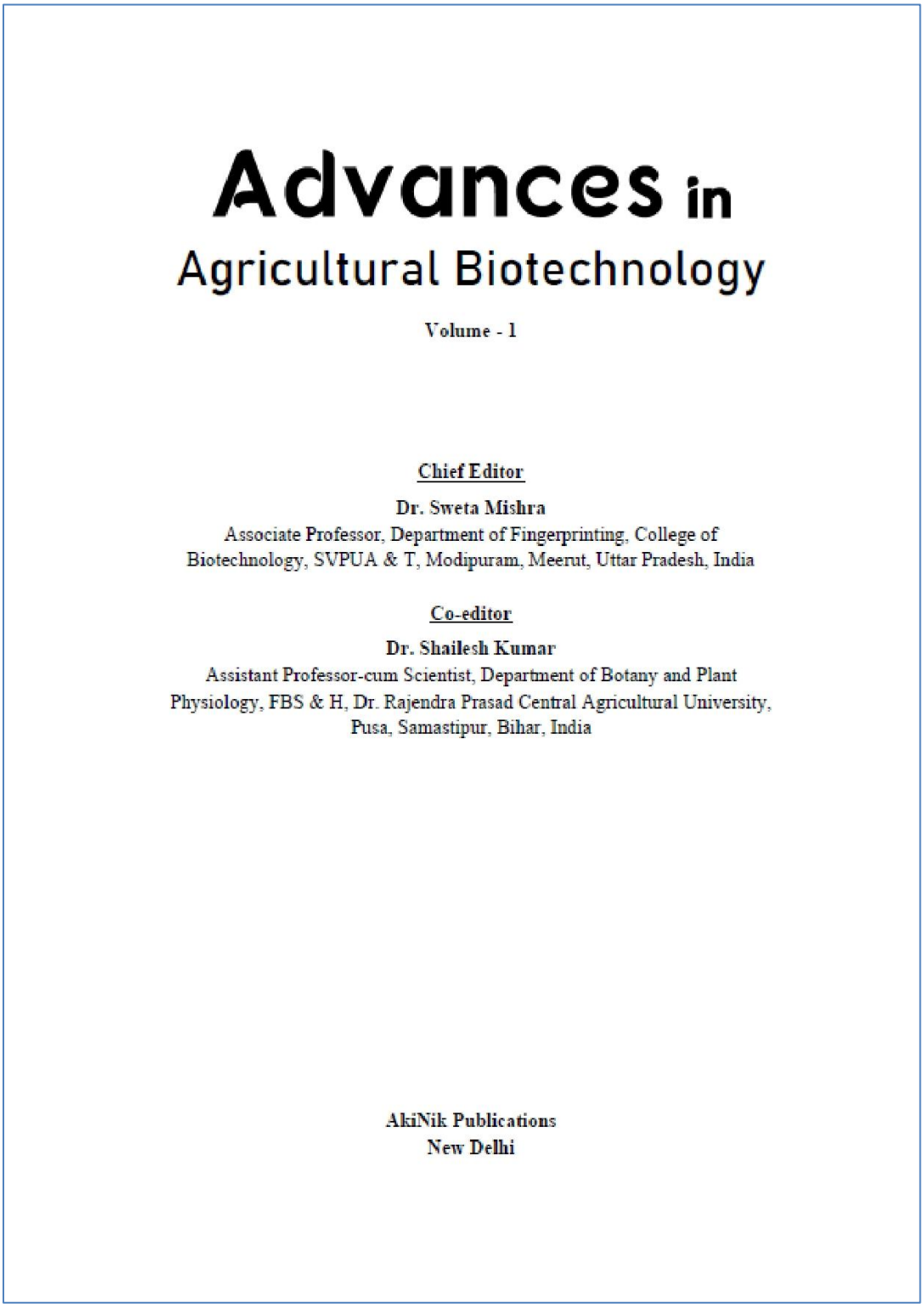
Abstract. Solar simulators based on light emitting diodes (LEDs) have shown great promise as alternative light sources for indoor testing of PV cells with certain characteristics that make them superior to the traditional solar simulators. However, large-area uniform illumination, more suitable for larger 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].

Publication of book chapter

Dr. P. U. Gajbe



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