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Study of order of kinetics in submicron $\text{LiCaAlF}_6\text{:A,Eu}$ (A=La and Y) phosphor

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Study of order of kinetics in submicron $\text{LiCaAlF}_6\text{:A,Eu}$ (A=La and Y) Phosphor

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Abstract. In this context the results on gamma induced thermoluminescence properties of submicron $\text{LiCaAlF}_6\text{:Eu}$ phosphor co-doped with lanthanum and Yttrium are reported. Phosphor shows good luminescence properties for thermal stimulation. The effect of ball milling on the order of kinetics in thermoluminescence processes was studied. The ball milling affects the kinetics of the thermoluminescence processes. The glow peak structures of the phosphors were found to be modified by the ball milling. However from the kinetics parameters obtained, it can be found that all the components contributing in the thermoluminescence processes employed first order kinetics. Hence the thermoluminescence processes in the phosphors are comprised of sum of one or more first order kinetics.

INTRODUCTION

Thermoluminescence (TL) for the dosimetry of ionizing radiations is well known since many years. Since the invention of LiF:Mg,Ti (known as TLD 100, Harshaw), this technique is well established and replaced the earlier used film dosimetry. TL dosimetry systems are less costly, successfully manufactured in India and routinely used for personnel monitoring. TL can also be used for monitoring high dose radiation (for example, from 10^2Gy up to 10^6Gy).

We have studied and reported the results on the optically stimulated luminescence properties of $\text{LiCaAlF}_6\text{:Eu}^{2+}$ [1]. Effect of La and Y co-doping in $\text{LiCaAlF}_6\text{:Eu}^{2+}$ was also studied [2]. It is reported that $\text{LiCaAlF}_6\text{:Eu,Y}$ exhibits intense TL and OSL signals. TL sensitivity is 3 times that of $\text{CaSO}_4\text{:Dy}$, while the OSL sensitivity is 7 times that of $\text{Al}_2\text{O}_3\text{:C}$ (Landauer). Negligible OSL fading was observed in the phosphor. However $\text{LiCaAlF}_6\text{:Eu,La}$ exhibits intense TL and OSL signals. TL sensitivity is 4 times that of $\text{CaSO}_4\text{:Dy}$, while the OSL sensitivity is 4 to 6 times that of $\text{Al}_2\text{O}_3\text{:C}$ (Landauer) [3].

The effect of ball milling on the order of kinetics of the TL processes in the phosphor is studied in this context.

EXPERIMENTAL

Eu doped LiCaAlF_6 was prepared by dissolving the analytical reagent grade chloride salts of the constituent metals in the stoichiometric ratios in a Polytetrafluoroethylene (PTFE) container and stoichiometric amount of HF was added to it dropwise. The precipitate was washed several times with doubly distilled water and dried. It was then rapidly heated in a graphite crucible in air till the powder completely melted. The melt was then quenched by pouring into another graphite crucible. The molten mass was crushed to powder and sieve to obtain the particle size in the range 72–210 μm referred as a bulk material. For co-doping the respective oxides of Lanthanum and Yttrium were used.



Intense white light luminescent Dy³⁺ doped lithium borate glasses for W-LED: A correlation between physical, thermal, structural and optical properties

P.P. Pawar, S.R. Munishwar, R.S. Gedam  

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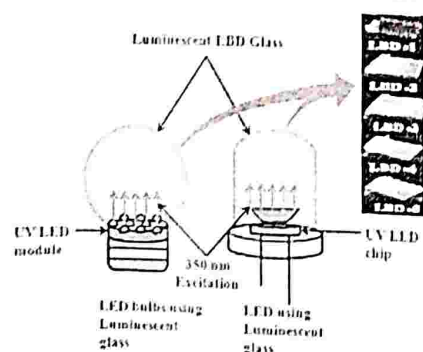
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Abstract

In this article the physical, thermal structural and optical properties of Dy³⁺ doped lithium borate glasses have been studied for white LED application. The emission spectra shows two intense emission bands at around 483nm and 574nm corresponds to the ⁴F_{9/2}→⁶H_{15/2} and ⁴F_{9/2}→⁶H_{13/2} transitions along with one feeble band at 663nm corresponds to ⁴F_{9/2}→⁶H_{11/2} transition. The average lifetime <τ> of Dy³⁺ were found to be about 2.95 and 4.94 ns for blue and yellow emission bands respectively. CIE chromaticity diagram shows glass LBD-4 containing 0.5 mol% Dy₂O₃ with colour co-ordinates x=0.33 and y=0.37 have highest emission intensity. These glasses having emission in the white region and thus can be used for bright white LED's and modern white LED bulbs.

Graphical abstract



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Full Length Article

Synthesis, characterization and photocatalytic degradation efficiency of CdS quantum dots embedded in sodium borosilicate glasses

S.Y. Janbandhu, S.R. Munishwar, R.S. Gedam  Show more  Share  Cite<https://doi.org/10.1016/j.apsusc.2018.02.065> [Get rights and content](#) 

Abstract

Borosilicate glass system ($\text{SiO}_2\text{-B}_2\text{O}_3\text{-Na}_2\text{O-ZnO}$) with the addition of 3 wt% CdS was prepared by conventional melt quenching method. Amorphous nature of glass sample was confirmed by XRD measurement. Glass transition temperature and crystallization temperature was determined from DTA curve. CdS quantum dots (QDs) were grown in this glass matrix by optimized heat treatment schedule which was confirmed by XRD measurement. The growth of CdS QDs was also confirmed by optical absorption spectra and photoluminescence (PL) measurement. Energy band gap was calculated from the absorption spectra and found to decrease with increase in size of QDs. The size of QDs measured by optical absorption and it was also confirmed by HR-TEM results. The increase in size of QDs is also noticed from emission spectra which show red shift in PL intensity. The glass embedded with CdS QDs were tested for photocatalysis study and it shows 70.6% and 68.0% photodegradation efficiency for 5 ppm and 10 ppm respectively.

Graphical abstract



Full length article

CdS/TiO₂ heterojunction in glass matrix: Synthesis, characterization, and application as an improved photocatalyst

S.Y. Janbandhu, [Apurita Joshi](#), [S.R. Munishwar](#), [R.S. Gedam](#)  Show more  Share  Cite<https://doi.org/10.1016/j.apsusc.2019.143758> Get rights and content 

Abstract

In this paper, sodium borosilicate glass SiO₂-B₂O₃-Na₂O-ZnO with 2 wt% CdS and 1 wt% TiO₂ were prepared by the melt quench technique. For the growth of QDs, single-step heat treatment was given using glass transition (T_g) and glass crystallization (T_c) temperature. Hexagonal and anatase phase of grown CdS and TiO₂ QDs were confirmed by XRD pattern. The size of powders was observed by SEM and cluster formation of CdS/TiO₂ QDs was studied by FESEM. EDS pattern confirms the elemental composition which was used during synthesis. The structural changes due to heat treatment were explored by FTIR study. The growth of QDs and size determination was done by HRTEM. An increase in the size of QDs with annealing time was confirmed by optical absorption and emission spectra.

Photocatalytic activity of Cd3:3 h (5.33 μm) and Cd3:5 h (3 μm) is investigated by degrading indigo carmine (IC) dye and degradation efficiency was found to be 85.30% and 91.64% respectively for 5 h.

Graphical abstract

Physical, structural, thermal and spectroscopic investigation of Sm_2O_3 doped LAB glasses for orange LED

P.P. Powar^a, S.R. Munishwar^a, D.D. Ramteke^b, R.S. Gedam^a  

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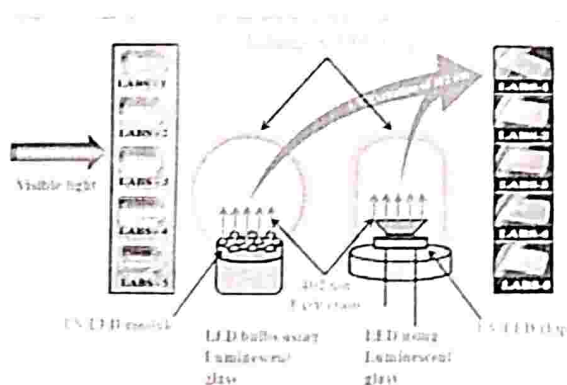
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Abstract

In this article, Sm_2O_3 doped Lithium Aluminoborate (LABS) glasses were prepared by melt-quench technique. Physical, structural, thermal and spectroscopic properties are investigated by various techniques. The emission spectra consist of three sharp peaks at 562.5, 599, 645.5 nm within the 4f electronic configuration of Sm^{3+} ions and two feeble emission peaks at 691, 711 nm of Sm^{2+} ion at 402 nm excitation. Among all prepared glass samples, glass doped with 0.5 mol% Sm_2O_3 (LABS-4) shows highest emission intensity with CIE chromaticity coordinates $x=0.55$ and $y=0.44$ in the orange zone of the chromaticity diagram. The CIE plot and the images of glass samples show; the glass doped with 0.5 mol% Sm_2O_3 emit intense orange light at 402 nm excitation and can be useful for intense orange LED application.

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Effect of annealing time on optical properties of CdS QDs containing glasses and their application for degradation of methyl orange dye

S.Y. Janbandhu, S.R. Munishwar, G.K. Sukhadeve, R.S. Gedam  

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Highlights

- Borosilicate glass system doped with CdS semiconductor was prepared by conventional melt quench technique.
- Growth of CdS QDs was controlled by optimized heat treatment schedule and confirmed by various characterization techniques.
- The size of CdS QDs increases and energy band gap decreases with increasing annealing time.
- Optical properties were tuned by controlling size of CdS QDs.
- CdS QDs embedded in glasses shows MO dye degradation.

Abstract

Borosilicate glass system ($\text{SiO}_2\text{:B}_2\text{O}_3\text{:Na}_2\text{O:ZnO}$) with the addition of 3 wt% CdS was prepared by conventional melt quench technique. Amorphous nature of glass sample was confirmed from XRD measurement. CdS QDs were grown in the glass matrix using an optimized heat treatment schedule in between glass transition (T_g) and crystallization (T_c) temperature. The phases of CdS QDs were noted by XRD and confirmed by HRTEM. Optical absorption study was carried out to measure the energy band gap and it is found that the energy band gap decreases with an increase in the size of QDs. Size determination was done by optical absorption spectra and match with HRTEM results. This change in the size of QDs was



Full Length Article

Influence of electron-hole recombination on optical properties of boro-silicate glasses containing CdS quantum dots

S.R. Munishwar, P.P. Pawar, R.S. Gedam  Show more  Share  Cite<https://doi.org/10.1016/j.jlumin.2016.09.045> [Get rights and content](#) 

Abstract

Semiconductor (CdS) quantum dots were grown in a glass matrix ($\text{SiO}_2\text{-B}_2\text{O}_3\text{-ZnO-Na}_2\text{O-K}_2\text{O}$) by controlled heat treatment. Growth of CdS quantum dots were confirmed by optical absorption (UV-vis), photoluminescence (PL), micro-Raman spectroscopy, X-ray diffraction (XRD) and High resolution transmission electron microscopy (HRTEM). The structural modification occur in glass matrix were studied with Fourier transform infrared spectroscopy (FTIR). Clusters formation due to heat treatment was studied by field emission gun scanning electron microscopy (FEG-SEM). The observed experimental data shows that the CdS QDs size is very well controlled by single stage heat treatment. Size dependent blue shift in optical energy band gap and blue energy shift in PL intensity was observed with annealing time. The overall study of these glasses suggests these glasses are useful as an optical filters.

Introduction

Semiconductor quantum dots (QDs) represent a general class of materials that are intermediate between bulk material and molecular species. Semiconductor quantum dots (QDs) with discrete electron and hole states exhibit quantum confinement effect therefore semiconductor quantum dots (QDs) exhibit size dependent molecular-like discrete electronic and optical properties [1]. Semiconductor Quantum dots are widely studied due to their unique electronic and optical properties compared to bulk materials [2]. The unique properties of semiconductor quantum dots (QDs) provide the possibility of applications in optoelectronic devices. Quantum dots are generally unstable and it is difficult to use these QDs for optoelectronic devices due to lack of proper solid matrix. Glass matrix provides the practical solution because of their good optical and mechanical properties. Glass is also chemically and thermally stable [3], [4]. The glasses doped with Semiconductor QDs have attracted great interest due to their optical properties.

Eu₂O₃ doped bright orange-red luminescent lithium alumino-borate glasses for solid state lighting

P.P. Powar, S.R. Munishwar, R.S. Gedam

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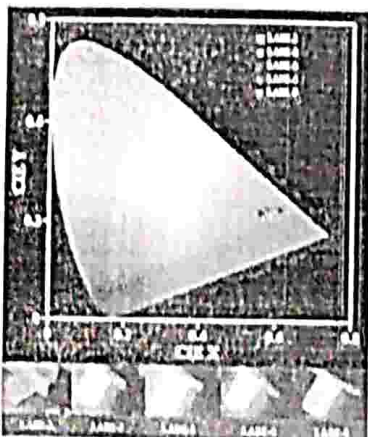
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Abstract

In present study, Eu₂O₃ doped Li₂O:Al₂O₃:B₂O₃ glasses (LBE) were synthesized by melt quenching technique. Physical, thermal, structural and spectroscopic properties of prepared glasses have been investigated by various techniques. X-ray Diffraction (XRD) spectroscopy confirms the amorphous nature of glass samples. FTIR spectra show various structural groups present in the present glass system. Luminescence spectra exhibit emission bands in the visible region from 570 to 725 nm. The emission peaks are located at 577.5, 589.5, 613.5, 652, 701 nm attributed to the ⁵D₀→⁷F_{0, 1, 2, 3 and 4 transitions. The CIE chromaticity diagram discloses glass LBE-4 having colour coordinates x=0.63, y=0.34 shows highest emission intensity among all glass samples. The glass LBE-4 lying in the red region of CIE 1931 chromaticity diagram and has been found well suited for solid-state lighting application.}

Graphical abstract





Growth of CdSSe quantum dots in borosilicate glass by controlled heat treatment for band gap engineering

S.R. Munishwar, P.P. Pawar, S.Y. Janbandhu, R.S. Gedam  

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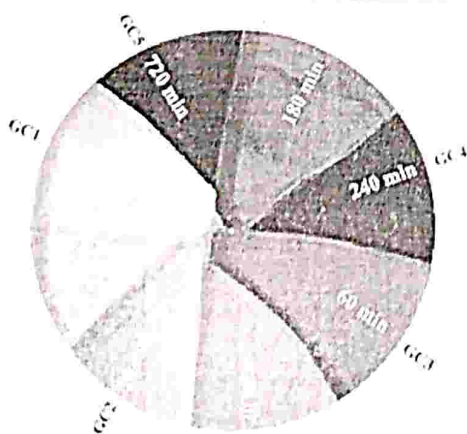
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Abstract

The glass system $\text{SiO}_2\text{—B}_2\text{O}_3\text{—ZnO—Na}_2\text{O—K}_2\text{O}$ with the addition of CdSSe semiconductor was synthesized by the conventional melt-quench method. The growth of QDs was confirmed using XRD, micro-Raman, and HRTEM study. The structural modification occurs in glass matrix due to nanocrystal growth has been studied from FTIR spectra. The optical properties of CdSSe quantum dots (QDs) grown in borosilicate glass matrix are investigated. The tuning of band gap of CdSSe QDs by controlled heat treatment is reported in the present study.

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S.R. Munishwar, P.P. Pawar, S. Ughade, R.S. Gedam

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The glass system $\text{SiO}_2\text{-B}_2\text{O}_3\text{-ZnO-Na}_2\text{O-K}_2\text{O-CdS}$ with addition of Dy^{3+} ions was synthesized by using conventional melt-quench method. The CdS quantum dots in a glass matrix was studied using optimized heat treatment schedule. The growth of quantum dots was confirmed by optical absorption (UV-Vis), X-ray diffraction (XRD) and High resolution transmission electron microscopy (HRTEM). The optical absorption and luminescence were studied for these glasses. The photoluminescence spectra shows energy transfer between CdS quantum dots and Dy^{3+} ions. Because of quantum confinement, CdS QDs emits light as a result of electron hole recombination and some energy is transferred to nearest energy level of the Dy^{3+} ions to give combined emission due to recombination of electron-hole and electronic transitions (i.e. $^4\text{F}_{9/2} \rightarrow ^6\text{H}_{15/2}$ and $^4\text{F}_{9/2} \rightarrow ^6\text{H}_{13/2}$) of Dy^{3+} ions.

Figure 1 consists of two parts. Part (a) is an energy band diagram for CdS QDs. It shows the conduction band (CB) and valence band (VB) with energy levels in eV. The CB levels are labeled from 2.0 to 3.2 eV, and the VB levels are labeled from 0.0 to 2.0 eV. Part (b) shows the photoluminescence (PL) spectra of CdS QDs. The main plot shows the PL intensity versus wavelength (nm) from 400 to 500 nm. It features a sharp peak at 412 nm (labeled 'PE') and a broader peak at 445 nm (labeled 'TS' for trap states). The inset shows the excitation spectrum (ES) and the absorption spectrum (AS) from 400 to 500 nm.

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Highly stable CdS quantum dots embedded in glasses and its application for inhibition of bacterial colonies

S.R. Munishwar^a, P.P. Pawar^b, S.Y. Janbandhu^a, R.S. Gedam^a  

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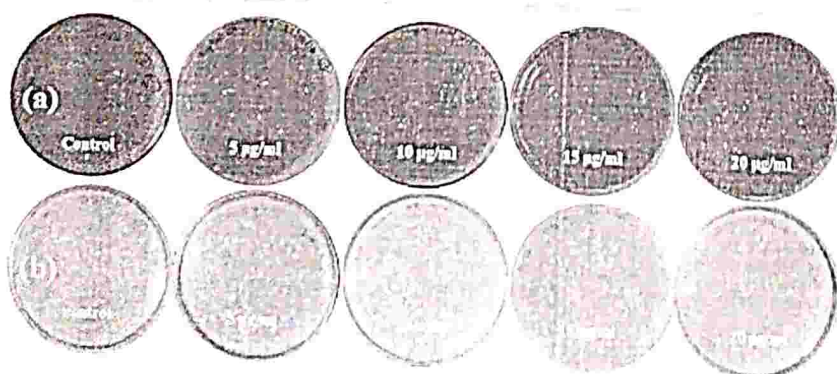
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Abstract

An inhibition of pathogenic bacteria using light source is an attractive phenomenon. The present study is based on the application of CdS quantum dots (QDs) grown in the glass matrix for growth inhibition of bacteria. Glass system $36\text{SiO}_2\text{--}15\text{B}_2\text{O}_3\text{--}15\text{Na}_2\text{O--}9\text{K}_2\text{O--}25\text{ZnO}$ with 3 wt % CdS was prepared by the melt-quench technique. CdS QDs were grown in glass matrix with single-step heat treatment and characterized by XRD, HRTEM, XPS, and micro-Raman for phase identification. Their size related to quantum confinement properties were studied with optical absorption (UV-Vis), photoluminescence (PL) spectroscopy. The structural and optical studies confirm the growth of CdS QDs in a glass matrix which was then utilized for antimicrobial activity. The generation and recombination of electron-hole pairs by CdS QDs due to absorption of light were responsible for the formation of reactive oxygen species (ROS). The use of these ROS in bacterial colonies inhibition has been discussed.

Graphical abstract



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Borosilicate glasses containing CdS/ZnS QDs: A heterostructured composite with enhanced degradation of IC dye under visible-light

S.Y. Janbandhu^a, Suhaila CT^a, S.R. Munishwar^a, J.R. Jayaramaiah^b, R.S. Gedam^a  

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<https://doi.org/10.1016/j.chemosphere.2021.131672> 

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Abstract

The glass system $\text{SiO}_2\text{-B}_2\text{O}_3\text{-Na}_2\text{O}_3\text{-ZnO}$ containing 2wt% CdS and 1wt% ZnS was synthesized by the conventional melt quench method. Glass transition temperature and crystallization temperature was determined from Differential thermal analysis (DTA) measurement to optimize heat-treatment. The amorphous structure of the glass was confirmed by the X-ray diffraction (XRD) measurement. Glasses were heat-treated by optimized heat-treatment schedule to grow CdS/ZnS QDs and crystalline phases of CdS and ZnS were confirmed by the XRD measurement. High-Resolution Transmission Electron Microscopy (HRTEM) was used to determine the size and shape of quantum dots (QDs) grown in the glass matrix. The optical band gap was calculated from the absorption spectra and found to decrease with increase in size of QDs. Electron-hole recombination rate was studied using a decay time and impedance analyzer. Prepared samples were tested as a photocatalyst under sunlight for the degradation of indigo carmine (IC) dye and photodegradation efficiency was found to be 73.6% and 87.2% for samples CZ1 and CZ4 respectively. No significant change is observed in degradation efficiency even for 4 cycles which confirms the stability of prepared glasses for dye degradation.

Graphical abstract

PAPER

Photoluminescence study of Sm^{3+} containing sodium borosilicate glasses and glass-ceramics

S R Munishwar¹, Kumar Roy¹ and R S Gedam¹

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Abstract

Glasses doped with Sm_2O_3 were prepared by conventional melt-quench technique. The glasses were characterized by XRD, density and glass transition temperature. These glasses were converted into glass-ceramic by two stage heat treatment schedule. Photoluminescence measurement was carried out for glasses and glass-ceramics. The glass samples when excited with 402 nm as an excitation wavelength, the luminescence spectra gives three bands at 562 nm, 601 nm and 647 nm due to $^4\text{G}_{5/2} \rightarrow ^6\text{H}_{5/2}$, $^4\text{G}_{5/2} \rightarrow ^6\text{H}_{7/2}$ and $^4\text{G}_{5/2} \rightarrow ^6\text{H}_{9/2}$ transitions, respectively. The current study indicates that these sodium borosilicate glasses show apparent change in emission intensity when they are converted into glass ceramics. The overall study suggests that these glasses can be used for LED application.

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Impact of Pranayama on Stress, Agony, and Quality of Life for Jobless People

Ms. Rachana Bhaskarrao Dumbhare¹, Dr. Ajit A. Shringarpure²

ABSTRACT

Even though the effectiveness of Pranayama has been widely studied, research with jobless groups is not all done in Indian scenario. Jobless people undergo from bigger levels of stress, agony, and negative life events that can present a complicated web of indissoluble stressors. Mind-body practices such as Pranayama may have the probable to reduce the negative impacts on stress and quality of life that may go together with their job instability. The objective of the present study was to examine the impact of Pranayama, a yoga-based breathing exercise, on perceived stress, agony, and quality of life among jobless adults at Nagpur city in India. Self-report method were collected from 117 Pranayama group participants and 79 participants who received normal treatment for stress reduction. An assessment of within group differences proposes that behaviour group respondents have experience statistically noteworthy improvements after only 4 to 6 sessions of Pranayama. Results from this research study suggests that Pranayama may be effectual in tumbling negative psychological states and improving quality of life for jobless people experiencing agony. Nevertheless, these outcomes must be interpreted with prudence due to the be short of adequate control group data. This research study highlights the importance of examining the possible of Pranayama for jobless and less income populations.

Keywords: Pranayama, jobless, stress, agony, quality of life.

INTRODUCTION

Recent review of literature examine the developing potential for implementing Pranayama for the general public (Chandrakala and Sekaran, 2009), those with psychiatric related disorders (Chandrakala and Sekaran, 2009; Rubini, 2009). Beneficial results of Pranayama and mind-body training have also been validated for individuals experiencing higher levels of agony due to health problems such as chronic-pain (Kabat-Zinn, 2005). Potential benefits have also been reported for those acute traumatic stress and uncontrollable life happenings such as conflict (Staples et. al., 2011), incarceration (Samuelson et. al., 2007) and huge-level disasters (Gerbarg, Wallace, and Brown, 2011).

One population with which Pranayama practices have yet to be studied are jobless people. Heightened levels of psychology oriented agony experienced by those who are jobless are well-evidenced (Wong and Piliavin, 2001). Joblessness affects individuals, families, and children across all genders, ages, religions, communities and geographic areas. While accurate counts of the jobless are difficult to obtain, it is estimated that approximately 20 to 35 million people in India experience joblessness on an annual basis.

Though stress and overcoming stress are perhaps one of the most widely studied topics in psychology today (Hobfoll, Schwarzer, and Chon, 1998), there appears to be a gap in the methodical oriented literature around the potential for stress reduction education programs to be of solution to jobless people (Parasuraman, 2002; Szerlip and Szerlip, 2002). Though the potential for stress reduction programs to improve health such as cardiovascular syndrome (Szerlip and Szerlip, 2002) and psychological disorders, only just one qualitative study was completed with jobless people (Parasuraman, 2002). Similarly, within the extensive body of Pranayama research only three studies examine Pranayama training with jobless individuals (Grabbe et al., 2011; Hick and Furlotte, 2010; Parasuraman, 2002). These exploratory studies underscore the potential benefit for stress reduction program and Pranayama training with the jobless and call for further exploration.

According to Patanjali, Pranayaman means regulation of breath or the control of prana is the stoppage of inhalation and exhalation, which follows after securing that steadiness of posture or seat. Swasa means inspiratory breath. Pravasa means expiratory breath. One can only take up the practice of Pranayama gaining steadiness in some specific Asana (posture). According to scientific Yoga literature, if one sit for three hours in one Asana continuously at one stretch, he/she considered to have gained mastery over the Asana. If one is able to sit from even half to one hour then, one can take up the practice of Pranayama. No one can make any spiritual progress without the practice of Pranayama, as per

Solar Trackers an emerging need for future Solar Power growth in India

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Abstract: "To cater the need of electricity" is the biggest challenge for the Indian Power sector and thus to get the maximum output from the installed capacity is of utmost importance. With the current scenario the effective use of the limited natural resources such as coal, gas, oil, water etc. are the key factors for a sustainable growth of any power utility and the nation's economy. As far as the power sector challenges are concerned, new technology adaptations and improvements in the existing systems play a very crucial role in the future. Hence effective & maximum use of renewable energy sources is an important factor for sustainable growth and is a solution to the limited resources of our Country. An innovative and technological adaption for effective use of renewable energy sources while optimally tapping the available natural resources is one of the important factors for the environment as well as for sustainable business. This can be achieved by using proper solar tracking system; the generation will be improved roughly by 20% to 40% with incremental value of capital project cost. The aim of this paper is to suggest the maximum use of the solar energy through solar trackers for optimum generation and mainly focused on need for solar tracking system, major types and benefits associated with trackers in solar PV project.

Keywords: Solar Tracking System, fixed tilt, stationary array, Single Axis Tracker, Double Axis Tracker, Solar photovoltaic (PV)

1. INTRODUCTION

Clean, cheap and abundant power is the basic requirement for the economic development of any city, state or country. In power sector, fossil fuels are widely used for many decades but due to the increasing cost and limited availability of the fossil fuels, renewable energy sources are one of the emerging sectors of future growth. Renewable energy sources such as wind energy, solar energy, small hydro power and biomass etc are abundant in India and they not only augment the energy generation, but also contribute to improvement in the environment, energy conservation, & additional employment. Among all the renewable energy sources, solar energy has very high potential which can also help in the effective utilization of the bare land to get maximum out of it. Solar energy is a very large, inexhaustible source of energy and could supply for all present and future electricity needs of the world on a continuous basis. This makes solar energy one of the most promising

unconventional energy sources. Solar modules use light energy (photons) from the Sun to generate electricity through the photovoltaic effect. Solar PV module technology is developing rapidly due to its easy conversion of electricity. At present our approaches are focused on improving PV module efficiency or use of modern equipment /system which will get the maximum output.

The below figure no 1 shows the renewable energy installed capacity of India (all figures are in MW).

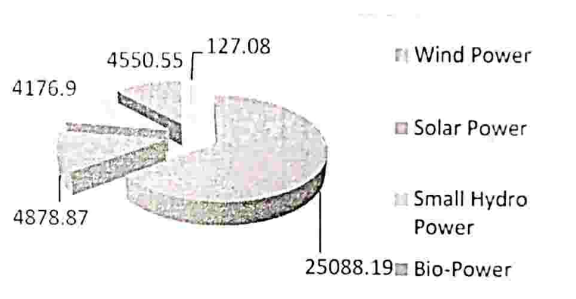


Fig 1. Programme/Scheme wise Physical Progress in 2015-16 (as on 31.12.2015) [refer from MNRE]

Solar energy has following few factors in our favor.

- 1) Unlike fossil fuels and nuclear power, it is environmentally clean source of energy.
- 2) Available in adequate quantities in almost all parts of the world where people live.
- 3) Energy harnessing is free of cost.
- 4) It has no heavy mechanical sections & is free from noise and any pollution.

Problem associated with the use of solar energy is that its availability varies widely with time. The variation in availability occurs daily because of the day night cycle and depends on seasons because of the Earth's orbit around the Sun. The main problem with solar energy is that it is a dilute source of energy. Even in the hottest regions on the Earth, the solar radiation flux can be of a low value for technological utilization. To rectify the above problems the solar panel should be tilted such that it always receives the maximum intensity of light for the maximum output.

The generation capability of a photovoltaic (PV) cell is mainly dependent on the intensity of the solar radiation. On the other hand, the changes in position of the Sun causes a variable shining intensity in different seasons and different times of the

CHAPTER 5

KEY INITIATIVES FROM GOVERNMENT OF INDIA FOR ONLINE AND DIGITAL EDUCATION

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ABSTRACT

New initiatives in the education field are necessary for today's realities and circumstances. The rise in epidemics and pandemics in recent days necessitates that we are ready with alternative modes of quality education whenever and wherever traditional and in-person modes of education are not possible. In recent days we have come to know the significance of leveraging the advantages of technology while acknowledging its potential risks and dangers. For this, we need to design scaled pilot studies carefully and appropriately to determine how the benefits of online/digital education can be reaped while addressing or mitigating the downsides. Meanwhile, the present digital platforms and ongoing ICT-based educational initiatives must be optimized and expanded to meet the current and future challenges in providing quality education for all.

Keywords: Key Initiatives, Government of India, Online and Digital Education

1.0 INTRODUCTION

The merits of online/digital education can be leveraged by eliminating the digital divide through concerted efforts, such as the Digital India campaign and the availability of affordable computing devices. It is important that the use of technology for online and digital education adequately addresses concerns of equity.

AGRICULTURAL IN VIDARBHA : PERFORMANCE AND PROBLEM AREAS

■ KAVITA N. BADWALK

Introduction:-

Agriculture plays a pivotal role in the Indian economy. Although the contribution to gross domestic product is now around one sixth, it provides employment to 56% of the Indian workforce. The forward and backward linkage effect of agriculture growth increases the income in the non agricultural sector. The growth of some commercial crops has significant potential for promoting exports of agricultural commodities and bringing about faster development of agro-based industries. Thus agriculture not only contributes to overall growth sector of the majority of the population in the country and thus it is the most inclusive growth sector of Indian economy.

Most of the villages in Vidarbha are badly in need of basic social infrastructure like all weather roads, drinking water, regular electricity, primary health care and basic education.

Agricultural in Vidarbha:-

Vidarbha region in western Maharashtra comprises of 11 districts of the Nagpur and Amravati division. These include Akola, Amravati, Wardha, Buldhana, Washim, Nagpur, Chandrapur, Bhandara, Gadchiroli and Gondia. The region occupies 31.6% of total area and holds 21.3% of total population of Maharashtra. Mainstay of agriculture here is cotton, soybean, pigeon peas, and chickpeas, most of these crops are rain fed. Due to a number of reasons like low rainfall, lack of irrigation, low micronutrients in soil, etc. the productivity of cotton of the region is lower than state (15% less) and national averages (46% less).

According to ministry of agriculture, adoption of Bt cotton (nearly 100%), which is more sensitive to shortage of water in a region without assured irrigation and irregular rainfall, has made cotton cultivation a high risk-high cost cultivation system in Vidarbha. 14 lakhs

19) Kautsk's $\mathcal{H}_2$ -norm

Introduction: Teacher Education is an integral part of an educational system. Teaching is both a skill and an art. Mass literacy goals as well as the emergence of technology transferred the very character of teacher training and its philosophy. The National Policy on Education 1986 reflects precisely this change in the concept and practice. The term 'teacher education' implies the lifelong development of pedagogical and disciplinary knowledge in relation to and understanding of theories of learning and development, the historical and philosophical contexts of education and the ability to adapt instruction to a variety of learning situations. Personality covers the whole nature of the individual. Psychology does not regard personality as a static entity but as dynamic character of the individual which finds expression through its conduct and activities.

A teacher is not simply an information monger. He goes beyond it. A teacher links his teaching with the "life" values of life. For example, we take the case of a teacher of psychology. He goes beyond mere dates and facts and gives an insight into the goals of life and society. He has to strive to create in his pupils a desire to improve and to find a better place than he found it. Hence, a teacher is expected to combine within himself thoroughness of knowledge and mastery of technique, together with a wholesome philosophy of life.

As a matter of fact, teachers are the mediators between the system of education and the students. The present study
there up throws light on the significant role of teacher and institutions in the development of students' personality.
Although most of the studies in this field are concerned with schools/colleges situation, hence, the results are
applicable to teacher and students' behavior in general.

These role that the teacher **must** fill. Here are the roles that a teacher often has to fill in order to be the best educator they can be.

resources. One of the top traits a teacher must fill is that a resource specialist. There will be many people who will come to the teacher seeking information. Even if the person is only seeking a resource of one or two resources to use, the teacher must know how to find what the student needs and not waste the student's time. The teacher must be able to find the resources and make them available to the student. The teacher must be able to find the resources and make them available to the student.

Post Independence Environment and Ecological Movement in India

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ABSTRACT

In the past two decades, environment has captured the attention of people, governments, scientists and even common in many parts of the world. There are increasing concerns of water, soil, air, forests, droughts, floods, scarcity of fuel, etc. and the use of hazardous chemicals and industries are also causing air, water and soil pollution. People are now aware of the need to protect the environment and its resources. This paper focuses on the view on environment of the Bhamhara district students. In having the questions to know the view on environment of 100th students.

Keywords: Post-Independence, Environment, Ecological Movement, India.

INTRODUCTION

Environment comprises everything around us. It includes humans, animals and invisible micro-organisms etc. Webster's unabridged dictionary defines environment as "The aggregate of all the external conditions and influences affecting the life and the development of an organism. The terrestrial environment is a composite of air, water & land. Each can be polluted physically or chemically. Since the environment represent not only a medium for the organism but also affects the, such as influences on human performance as noise levels also affect the environment.

FAMOUS MOVEMENT TO PROTECT ENVIRONMENT IN INDIA

Bishnoi Movement

Amrita Devi, a female villager could not bear to witness the destruction of both her faith and the village's sacred trees. She hugged the tree and encourage the others to do the same. 363 Bishnoi villagers were killed in this movement. The Bishnoi tree martyrs were influenced by the teaching of Guru Maharaj Jambhiji, who founded the Bishnoi faith in 1485 and set of principles forbidding harm to tree and animals. The king came to know about these events rushed to the village and apologized, ordering the soldiers to cease logging operations. Soon afterward the maharajah designated the Bishnoi state as a protected area, forbidding harm to trees and animals.

Chipko Movements

Mr. Bahuguna enlightened the villagers by conveying the importance of trees in the environment which checks the erosion of soil, causes rains and provides pure air. The women of Advani village of Tehri Garwal tied the sacred thread around trunks of trees and they hugged the trees, hence it was called 'Chipko Movement' or 'Hug the tree movement'. The main demand of the people in these protests was that the benefits of the forest should go to the local people.

Save Silent Valley Movement

The Kerala State Electricity Board proposed a hydroelectric dam across the Kunthipuzha River that runs through silent Valley. In February 1973 the planning commission approved the project at the cost of about Rs. 25 cores. Many feared that the project would submerge 8.3sq km of untouched moist evergreen forest. Several NGOs strongly opposed the project and urged the government to abandon it.