

chemistry of pure and Eu^{3+} doped Sr_2CeO_4 phosphor. XPS spectra of the samples elucidated that Ce atoms on the surface are in the +4 oxidation state, though the existence of other states (+3) cannot be excluded. A depth profiling of Eu^{3+} doped Sr_2CeO_4 with ion sputtering showed an increased Ce concentration in the subsurface region (internal part of grains) having 30 nm depth with respect to surface concentration of Ce. The peak values of Sr $3d_{5/2}$ from the surface of all samples were centered at about 132.9 eV. An open aperture z-scan technique was employed to investigate the nonlinear optical properties of Sr_2CeO_4 and Sm^{3+} modified phosphor prepared by the conventional method. The z-scan data was analysed to extract the nonlinear parameters namely nonlinear absorption coefficient.

Chapter 6 describes the conclusion and future work. This chapter sums up the salient features of the work described in this thesis and the scope for potential developments in this field.

The research work presented in the thesis has either been published in or communicated to reputed international journals, conference proceedings and presented in various national/international seminars.

Papers published in International Journals

1. *A New Synthetic pathway of Sr_2CeO_4 phosphor and its characterization*,
R. Seema and K. Nandakumar,
Journal of Luminescence, 131 (2011) 2181-2184.
2. *An open aperture z-scan study of Sr_2CeO_4 blue phosphor*,
R. Seema, C. S. Suchand Sandeep, Reji Philip and K. Nandakumar,
Journal of Alloys and Compounds, 509 (2011) 8573-8576.
3. *X-ray Photoelectron spectroscopic studies of pure and Eu^{3+} doped Sr_2CeO_4* ,
R. Seema, Janez Kovac, Uros Cvelbar, K. Nandakumar, Solid State Communications (communicated).
4. *Colour tuning capability of Eu^{3+} doped Sr_2CeO_4 phosphors*,
R. Seema, Nuja S. John, K. Nandakumar, Material Letters (communicated).
5. *Structural and Phonon side Band analysis of Eu^{3+} doped Sr_2CeO_4*
R. Seema, K. Nandakumar, Journal of Solid State Chemistry (communicated).

Papers published online

1. *Sol-gel synthesis and characterization of Sr₂CeO₄ blue nano phosphor*,
R. Seema and K. Nandakumar,
Applied Science Innovations Private Limited, India,
Proceedings of ICNM-2009, Pages: 278-285.
2. *Synthesis and characterization of Sr₂CeO₄*,
R. Seema and Nandakumar Kalarikkal,
1ST KERALA WOMEN'S SCIENCE CONGRESS 10-12 August 2010,
held at St. Theresa's College, Ernakulam, Kerala, Page-115.
3. *Luminescence and optical limiting properties of Sr₂CeO₄ blue emitter*,
R. Seema, C. S. Suchand Sandeep, Reji Philip and K. Nandakumar,
Proceedings of the 55th DAE-Solid State Physics Symposium 2010,
American Institute of Physics Conference Proceeding, 1349, (2011) 1273-1274.

Papers presented in various seminars, symposia and national/international conferences

1. *Synthesis and Optical properties of pure and rare earth doped Sr₂CeO₄ Phosphors*,
R. Seema and Nandakumar Kalarikkal,
2nd International Conference on Nanomaterials (ICN-2012) during January 12- 15, 2012 (accepted).
2. *Multiple Color Capability from Eu³⁺ doped Sr₂CeO₄ Phosphors*,
R. Seema and Nandakumar Kalarikkal,
OPTICS' 11 held at NIT Calicut, Kerala during May 23-25, 2011.
3. *Optical limiting property of Sr₂CeO₄ blue phosphor*.
R. Seema and Nandakumar Kalarikkal,
55th DAE- Solid State Physics Symposium held at Manipal University, Manipal, Karnataka during December 26-30, 2010.
4. *Synthesis and characterization of Sr₂CeO₄*,
R. Seema and Nandakumar Kalarikkal,
1ST KERALA WOMEN'S SCIENCE CONGRESS,
held at St. Theresa's College, Ernakulam, Kerala, during August 10-12, 2010
5. *Structural and Optical properties of nanostructured Sm³⁺ modified Sr₂CeO₄ Blue Phosphor*,
R. Seema and Nandakumar Kalarikkal,
2nd International Conference on Nanomaterials (ICN) during April 26-29, 2010

6. *Structural and photoluminescent property of sol-gel synthesized Sr₂CeO₄ nanorods,*
R. Seema and Nandakumar Kalarikkal,
Nano structured materials and nano photonics (NSMNP-2010) organized by Department of Physics, St. Therasas College, Ernakulam, Kerala during February 4-5, 2010.
7. *Structural and optical characterization of sol-gel synthesized Sr₂CeO₄ blue phosphor,*
R. Seema and Nandakumar Kalarikkal,
54th DAE-Solid State Physics Symposium held at IIT Vadodara, Gujarat during December 13-16, 2009.
8. *Synthesis and characterization of Sr₂CeO₄ blue phosphor powder by sol-gel method,*
R. Seema and Nandakumar Kalarikkal,
National Symposium for Materials Research Scholars (MR-09), held at Dept of Metallurgical Engineering & Materials Science, IIT Bombay during May 8-9, 2009.
9. *Sol-Gel synthesis and characterization of Sr₂CeO₄ blue nano phosphor,*
R. Seema and Nandakumar Kalarikkal,
1st International Conference on Nanostructured materials and Nanocomposites (ICNM)-2009 during April 6-8, 2009.
10. *Synthesis and characterization of pure and Sm³⁺ modified Sr₂CeO₄,*
R. Seema and Nandakumar Kalarikkal,
National Seminar on Photonic Materials, held at Dept of Physics, Kariavattom Campus, Kerala University during February 26-28, 2009.

Papers published in International Journals as a co-author

1. *Structural and photoluminescence studies on nanosized samarium doped Strontium Barium Niobate ceramics,*
Nuja S. John, **R. Seema** and K. Nandakumar,
Spectroscopy Letters (in Press) 2011.

Papers presented in various seminars, symposia and national/international conferences as a co-author.

1. *Photoluminescence of Sm³⁺ doped Strontium Barium Niobate Ceramics*
Nuja John, **R. Seema**, Nandakumar Kalarikkal,
National Laser Symposium held at BARC Mumbai during January 10-13, 2005.