Summary

Name of Principal Investigator: **Rajshekhar S. Ukare**

Title of the Project **:** 'Luminescence characteristics of oxide based phosphors'

Department : Physics

Name of the College : Chhotabhai Javerbhai Patel Arts & commerce College, Tirora

Date of starting of project : 01-04-2013 and date of completion of Project: 31-03-2015

1. **OBJECTIVES OF THE PROJECT** :

The present study was undertaken with following main objectives in mind:

i) To prepare novel oxide based inorganic phosphor powder for good optical properties. Oxide is chemical compound that contain at least one oxygen atom in its chemical formula.

ii) To prepare oxide based inorganic phosphor from different methods, which should be cost effective and high lumen output than commercially used materials for the eco-friendly lighting.

iii) Characterization of rare earth activated oxide based phosphor by SEM, FTIR, and XRD for structure properties and PL for optical properties in many field of display application, energy converter and lighting purpose

2. **ACHIEVEMENTS FROM THE PROJECT**:

This study will help to researcher to enhance the optical properties of available commercial Y_2O_3:$Eu^{3+}$and Gd_2O_3: $Eu^{3+}$with Li^+ and Zn^{2+} as co-activator. Precipitation method was found to be good method in our laboratory for novel oxide based inorganic phosphor powder for good optical properties.

Prepared Sr_2CeO_4:Eu^{3+}, $Dy3^+$ by precipitation method shows good color co-ordinate and CIE which can be used for solid state lighting.

3. **CONTRIBUTION TO THE SOCIETY** :

- The research for new material for lighting applications (LEDs and fluorescence) and display applications (PDP and FDP) based on inorganic material tuned to challenge for chemical and physical research in last five year.
- Since prepared phosphor can be used for making lamps, display application like color TV screens, flat panel display, light emitting diode, detector for x-ray imaging, scintillation detector, paint, ink, whitener and solar concentrations (solar energy converter), photo-voltaic cells, non-linear optics,etc.
- Now a day there is growing demands of new materials and synthesis techniques to improve the performance of phosphors, thus we proposed the precipitation method as best cost effective method with high output luminescence application.
- Based on this work Ph.D. Thesis has been submitted to R. T. M. Nagpur university Nagpur For fulfill of Ph. D. Degree.
- 02 Paper has been published in international journals based on this work.

Principal Investigator

Rajshekhar S. Ukare