Editor's Note

The present volume "Luminescent Materials and their Applications" is 3rd in Defect and Diffusion Forum Series being published by Trans Tech Publications, Switzerland. It is pertinent to note that Luminescence phenomenon has once again occupied a central stage with the announcement of Nobel Prize in October 2014 to three Japanese scientists. The discovery of Galium Nitride proved to be a revolutionary step forward in creation of Blue LEDs. With the advent of LED lamps we now have more long-lasting and more efficient alternatives to older light sources.

The Volume under reference consists of 9 Chapters, written by experts in the area of Luminescent Materials. First 5 Chapters are contributed as Review Papers and the last 4 are based on Research Papers. Chapter 1 is contributed by H.S. Virk, editor of this Volume, under the Title: "History of Luminescence from Ancient to Modern Times". It traces the history of Luminescence based on E. Newton Harvey's 770 page volume, which is a Classic in this area and narrates interesting stories from ancient cultures to modern times. The author has summarized the results of investigations of Bangalore Group under Sir CV Raman, the Indian Nobel Laureate of 1930. He has called "The Physics Nobel Prize 2014," an Award for Luminescence.

Chapter 2 is contributed by Sanjay Tiwari and JV Yakhmi on an important Topic: "Recent Advances in Luminescent Nanomaterials for Solid State Lighting Applications". In fact, the recent Nobel Prize 2014 in Physics has been awarded for development of Luminescent Materials. The authors write: "Luminescent nanomaterials have attracted great interest worldwide because of their unusual structural, optical and electronic properties as well as efforts to prepare miniaturised devices. By understanding and manipulating these properties, the performance of the resulting optical structure can be tailored for desired end-use applications".

Chapter 3: "Persistence Mechanisms and Applications of Long Afterglow Phosphors" is contributed by NPL, New Delhi Group of V. Shankar and D. Haranath. The authors present a broad review of long persistence (LP) materials that are a special kind of photon energy storage and conversion materials. These are also known as long afterglow phosphors or long decay phosphors (LDP). This review Paper covers the recent advances in the blue, green and red-emitting LP phosphors/nanophosphors, persistence mechanism involved and the basic problems associated with their luminescence efficiency and persistence times.

Chapter 4 by the Group of SK Omanwar: “Exploring Synthesis Techniques for Yttrium Based Phosphors” is focused on synthesis techniques developed by author’s group. An inter-comparison of various techniques is listed and data presented in 9 tables. The synthesis methods of yttrium based phosphors in terms of the particle sizes, morphology, required temperatures for synthesis, cost required for synthesis, and required time, are presented in this review in detail.

Chapter 5 is contributed by the team of BP Chandra, a renowned scholar in ML, under the title: “Mechanoluminescence of Coloured Alkali Halide Crystals”. It is one of the longest Chapters in this volume and focusses on both Theoretical and Experimental aspects of elastico-mechanoluminescence (EML), plastico-mechanoluminescence (PML) and fracto- mechanoluminescence (FML) of coloured alkali halide crystals in all details.

Chapters 6 & 7 are contributed by an upcoming Group working under Dr Sanjay Dhoble of RTM university Nagpur. The authors investigate PL and TL properties of Eu^{2+} and Ce^{3+} Activated $BaAlSi_5O_2N_7$ Phosphors in the 6th Chapter: “Photoluminescence and Thermoluminescence Properties of Eu^{2+} and Ce^{3+} Activated $BaAlSi_5O_2N_7$ Phosphors”. TL dose response of $BaAlSi_6O_2N_7:Eu^{2+}$ Phosphor was found to be linear in the dose range from 5.8 mGy to 22.5 mGy, and above this, it goes to the saturation level. 7th chapter: “Photoluminescence Properties of $YAl_3(BO_3)_4:RE^{3+}$ (RE=Ce/Dy/Tb) Phosphors” is also focused on PL properties of phosphors. It was found that this phosphor acts as a potential color tunable UV phosphor for white light LED devices.

Chapters 8 & 9 are contributed by Meera Ramrakhiani Group of RD University, Jabalpur. EL studies have been made by this group of young researchers in their contributed Papers: **“**Electroluminescence in Organically Capped Cd_{1-x} Zn_xSe Chalcogenide Nanocrystals” and “Synthesis and Electroluminescence of Silver Doped ZnS/PVK Nanocomposite”, respectively. It is interesting to note that research work on Nanocomposites has been recognized to boost the economy at global level. Effect of Silver doping and ZnS loading has been investigated on the performance of ZnS/PVK nanocomposite in the last Chapter of this Volume.

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H.S. Virk

Editor