4th Special Issue on the Workshop on Next-generation Front-edge Optical Science Research

Preface

Various luminescent phosphor materials have been used for the detection of ionizing radiation. Ionizing radiation detection using the luminescence phenomenon includes scintillation, thermally stimulated luminescence (TSL), optically stimulated luminescence (OSL), and radio photoluminescence (RPL). These luminescence processes have been used to detect ionizing radiation doses in various fields of science and industry, such as basic physics, nuclear medicine, medical imaging, environmental and individual radiation monitoring, space dosimetry, and radiography. The demand for higher quality phosphor materials has increased owing to emerging applications in various fields, particularly radiation dose monitoring around the site of Fukushima Nuclear Power Plant in the wake of the serious accident on March 11 in 2011.

At present, however, the mechanism underlying the various luminescence processes under ionizing radiation is unknown. In order to develop higher quality phosphor materials, both the development of novel materials and investigation into the basic processes associated with excited states are important.

The workshop on Next-generation Front-edge Optical Science Research showcases recent achievements in this field from the viewpoint of phosphor material physics and chemistry for ionizing radiation detection. The 1st, 2nd, and 3rd special issues were published in April 2015 (seven papers, *Sensors and Materials*, Vol. 27, No. 3), August 2016 (twelve papers, *Sensors and Materials*, Vol. 28, No. 8.), and October 2017 (eleven papers, *Sensors and Materials*, Vol. 29, No. 10), respectively.

For this 4th special issue, twelve papers have been accepted pending mandatory changes and final examination by the Guest Editor. This special issue presents the current development of sensor technology for ionizing radiation, especially in academic research.

In closing, I sincerely thank Dr. Yutaka Fujimoto, Tohoku University, for his meticulous editing, and Ms. Misako Sakano, Editorial Department of MYU K.K., for her kind support in the publication of this 4th special issue.

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