6th Special Issue on the Workshop on Next-generation Front-edge Optical Science Research

Preface

Ionizing radiation detectors and sensors have been widely used for many industrial and scientific applications, and most of these sensors use luminescent materials as the main device. Such luminescent materials are roughly clasified into two types, namely, cintillators and storage phosphors. Scintillators can convert ionizing radiation into thousands of low energy photons from ultraviolet to near-infrared wavelengths immediately after the absorption of the ionizing radiation via electromagnetic interactions. On the other hand, storage phosphors can accumulate the energy of the ionizing radiation as a form of carrier trapping within several weeks. These storage phosphors can be classified as three types depending on the luminescence mechanism, namely, optically stimulated luminescence (OSL), thermally stimulated luminescence (TSL), and radiophotoluminescence (RPL). These storage phosphors are mainly used for individual personal dosimeters and imaging plates. In this special issue, we focus on such luminescent materials for ionizing radiation detectors and sensors as well as new analysis techniques of materials using ionizing radiation.

The Workshop on Next-generation Front-edge Optical Science Research showcased recent advances in this field from the viewpoint of phosphor material physics and chemistry for ionizing radiation detection. The 1st, 2nd, 3rd, 4th, and 5th special issues were published in 2015 (seven papers, Vol. 27, No. 3), 2016 (twelve papers, Vol. 28, No. 8.), 2017 (eleven papers, Vol. 29, No. 10), 2018 (twelve papers, Vol. 30, No. 7), and 2019 (ten papers, Vol. 31, No. 4), respectively. For this 6th special issue, seventeen papers have been accepted pending mandatory changes and final examination by the Guest Editor. In this special issue, we present 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 6th special issue.

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