

CONTENTS

**5TH SPECIAL ISSUE ON THE WORKSHOP ON NEXT-GENERATION
FRONT-EDGE OPTICAL SCIENCE RESEARCH
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TECHNOLOGY) AND HIDEHITO NANTO (KANAZAWA INSTITUTE OF TECHNOLOGY)**

Preface

Research Papers of Special Issue

Materials

- Scintillation Properties of Sn-doped Yttrium Aluminum Garnet (YAG) (S & M 1848)
Takayuki Yanagida, Hirokazu Masai, Masanori Koshimizu, and Noriaki Kawaguchi.....1225
- Scintillation Properties and Alpha-ray Detection Capabilities of Thin-film Plastic Scintillators (S & M 1849)
Masanori Koshimizu, Takayuki Yanagida, Ryoji Kamishima, Yutaka Fujimoto,
and Keisuke Asai.....1233
- Photoluminescence and Scintillation Properties of Rb₂CeCl₅ Crystal (S & M 1850)
Yutaka Fujimoto, Keiichiro Saeki, Daisuke Nakauchi, Takayuki Yanagida,
Masanori Koshimizu, and Keisuke Asai1241
- Luminescence and Scintillation Properties of Eu-doped CaAl₂O₄ Bulk Crystals (S & M 1851)
Daisuke Nakauchi, Noriaki Kawaguchi, and Takayuki Yanagida.....1249
- Scintillation and Dosimetric Properties of Sn-doped ZnO-SiO₂-B₂O₃ Glasses (S & M 1852)
Noriaki Kawaguchi and Takayuki Yanagida1256
- Vacuum-UV-excited Photoluminescence and Scintillation Properties of CsCl Transparent Ceramics and
Single Crystal (S & M 1853)
Hiromi Kimura, Takumi Kato, Daisuke Nakauchi, Masanori Koshimizu,
Noriaki Kawaguchi, and Takayuki Yanagida1265
- Photoluminescence and Scintillation Properties of Ce-doped SrHfO₃ (S & M 1854)
Hiroyuki Fukushima, Daisuke Nakauchi, Noriaki Kawaguchi,
and Takayuki Yanagida.....1273
- Dopant Concentration Dependence of Luminescence in Cu-doped Lithium Aluminophosphate Glasses
(S & M 1855)
Daiki Shiratori, Yuya Isokawa, Noriaki Kawaguchi, and Takayuki Yanagida.....1281
- Scintillation Properties of Yttrium-stabilized Zirconia Crystals Synthesized by the Floating-zone Method
(S & M 1856)
Masaki Akatsuka, Daisuke Nakauchi, Noriaki Kawaguchi, and Takayuki Yanagida1289

Relationship between Valence States of Copper in Aluminophosphate Glasses and the Emission Properties
(S & M 1857)

Hirokazu Masai, Hironori Ofuchi, Go Okada, Noriaki Kawaguchi,
and Takayuki Yanagida.....1297

5TH 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 the sensors use luminescent materials for the main device. Such luminescent materials are roughly classified into two types: scintillators and storage phosphors. Scintillators can convert ionizing radiation to thousands of low-energy photons from ultraviolet to near-infrared wavelengths immediately after the absorption of the ionizing radiation. The storage phosphors can accumulate the energy of ionizing radiation by carrier trapping within several weeks. These storage phosphors can be recognized as three types depending on the luminescence mechanism: optically stimulated luminescence (OSL), thermally stimulated luminescence (TSL), and radiophotoluminescence (RPL). In this special issue, we focus on such luminescent materials for ionizing radiation detectors and sensors.



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 the detection of ionizing radiation. The 1st, 2nd, 3rd, and 4th 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), October 2017 (eleven papers, *Sensors and Materials*, Vol. 29, No. 10), and November 2018 (twelve papers, *Sensors and Materials*, Vol. 30, No. 7), respectively. For this 5th special issue, ten papers have been accepted pending mandatory changes and final examination by the Guest Editors. 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 5th special issue.

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