Accepted Manuscript

PL and TSL properties of tin-doped zinc sodium phosphate glasses

Shotaro Hirano, Naoki Kawano, Go Okada, Noriaki Kawaguchi, Takayuki Yanagida

PII: S1350-4487(17)30792-8

DOI: 10.1016/j.radmeas.2018.03.002

Reference: RM 5881

- To appear in: Radiation Measurements
- Received Date: 29 November 2017
- Revised Date: 9 February 2018
- Accepted Date: 8 March 2018

Please cite this article as: Hirano, S., Kawano, N., Okada, G., Kawaguchi, N., Yanagida, T., PL and TSL properties of tin-doped zinc sodium phosphate glasses, *Radiation Measurements* (2018), doi: 10.1016/j.radmeas.2018.03.002.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



ACCEPTED MANUSCRIPT

Title: PL and TSL properties of tin-doped zinc sodium phosphate glasses

Authors: Shotaro Hirano, Naoki Kawano, Go Okada, Noriaki Kawaguchi, Takayuki Yanagida

Affiliation: Nara Institute of Science and Technology

Keywords: phosphate glass, ns²-ion, PL, TSL, dosimeter

Abstract

Photoluminescence (PL) and thermally-stimulated luminescence (TSL) properties of Sn-doped zinc sodium phosphate glasses were evaluated. We synthesized the glass samples by the conventional melt-quenching method under ambient atmosphere. The glasses were highly transparent in 400-2700 nm. Depending on the concentration of Sn, PL quantum yield (*QY*) ranged from 7.7 to 25.7%, and the PL*QY* increased with increasing the concentration of Sn. The Sn-doped samples showed PL with a broad feature due to the $5\text{sp}\rightarrow5\text{s}^2$ transition of Sn²⁺. The PL decay constants were 4.72-4.83 µs, and any dependence on the concentration of Sn was not observed. The glasses showed intense TSL, and the glow curves had a broad feature peaking at 110°C. Among the present samples, the 0.5% Sn-doped sample exhibited the highest sensitivity with a good linearity over 5 orders of magnitude (0.1-10000 mGy). In addition, the TSL fading characteristics were evaluated, and the integrated TSL intensities after two days were 5.5% (undoped), 41% (Sn:0.1%), 38% (Sn:0.2%), 40% (Sn:0.5%) and 35% (Sn:1.0%), respectively.

CR CR

Download English Version:

https://daneshyari.com/en/article/8249833

Download Persian Version:

https://daneshyari.com/article/8249833

Daneshyari.com