

Abstract Submitted
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Multi-colored luminescence from luminescent nanocrystalline silicon particles terminated by nitrogen TOMONORI FUJINO, KEISUKE SATO, KENJI HIRAKURI, YASUHIRO FUKUI, TOKYO DENKI UNIVERSITY TEAM, INTERNATIONAL CENTER FOR MATERIALS NANOARCHITECTONICS, NATIONAL INSTITUTE FOR MATERIALS SCIENCE COLLABORATION — The visible luminescence from the hydrogen-terminated nanocrystalline silicon (nc-Si) particles rapidly degrades by just after immersion in pure water. This was closely related to the formation of the defects due to the hydrogen-desorption from the particle surface. In solving the problem on the short time, it is necessary to fabricate a stable bonding in surrounding surface by other elements. In this paper, the photoluminescence (PL) property of the nitrogen-terminated nc-Si particles with multi-colored luminescence in pure water has been investigated. The surface composition and the luminescence property of samples were estimated by using a FT-IR spectroscopy and PL measurements. On the PL property of the samples, the nitrogen-terminated nc-Si particles brought the multi-colored luminescence and stability in the long term in comparison with the hydrogen-terminated nc-Si particles. By these results, the nitrogen-terminated nc-Si particles are expected to use in the industrial applications.

Tomonori Fujino

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