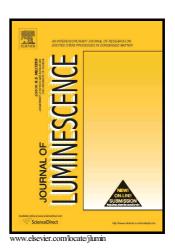
# Author's Accepted Manuscript

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PII: S0022-2313(18)30112-1

DOI: https://doi.org/10.1016/j.jlumin.2018.04.012

Reference: LUMIN15527

To appear in: Journal of Luminescence

Received date: 22 January 2018 Revised date: 5 March 2018 Accepted date: 6 April 2018

Cite this article as: Jin Young Park, Sung Jun Park and Hyun Kyoung Yang, Rapid visualization of latent fingerprints with Eu-doped La<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub>, *Journal of Luminescence*, https://doi.org/10.1016/j.jlumin.2018.04.012

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#### **ACCEPTED MANUSCRIPT**

## Rapid visualization of latent finger prints with Eu-doped La<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub>

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#### **Abstract**

Fingerprints provide significant unique identification of individuals. Fingerprint technology requires luminescent materials with high contrast, high selectivity, low background interface and high efficiency. Herein, a novel red-emitting La<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub>:Eu<sup>3+</sup> phosphors are synthesized by a solvothermal reaction method for latent fingerprint application. The structural properties are investigated by the X-ray diffraction analysis, Rietveld refinement and Raman spectroscopy. The optical properties are studied by the measurement of diffused reflectance, excitation and emission spectra. The PLE spectra of La<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub>:Eu<sup>3+</sup> phosphor exhibits both host absorption and charge transfer bands along with ff transitions of Eu<sup>3+</sup> ions. The PL spectra exhibit an intense red emission due to the  ${}^5D_0 \rightarrow {}^7F_2$ transition with the CIE chromaticity coordinates (0.614, 0.383). The latent fingerprints on the surface of various substrates are developed and exhibit excellent visualization with clear papillary ridges under the UV illumination of 254 nm. These results suggest that the La<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub>:Eu<sup>3+</sup> phosphors are promising luminescence materials for latent fingerprint technologies.

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