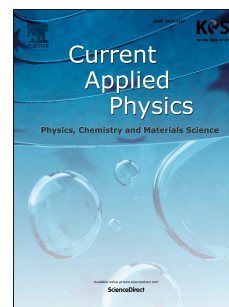


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## Resonant Inelastic X-ray Scattering of Tantalum Double Perovskite Structures

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In this paper, we investigated the electronic structures and defect states of SrLaMgTaO<sub>6</sub> (SLMTO) double perovskite structures by using resonant inelastic x-ray scattering. Recently, Eu<sup>3+</sup> doped SLMTO red phosphors have been vigorously investigated due to their higher red emission efficiency compared to commercial white light emitting diodes (W-LED). However, a comprehensive understanding on the electronic structures and defect states of host SLMTO compounds, which are specifically related to the W-LED and photoluminescence (PL), is far from complete. Here, we found that the PL spectra of SLMTO powder compounds sintered at a higher temperature, 1400°C, were weaker in the blue emission regions (at around 400 nm) and became enhanced in near infrared (NIR) regions compared to those sintered at 1200°C. To elucidate the difference of the PL spectra, we performed resonant inelastic x-ray spectroscopy (RIXS) at Ta L-edge. Our RIXS result implies that the microscopic origin of different PL spectra is not relevant to the Ta-related defects and oxygen vacancies.

Keywords: Resonant Inelastic X-ray Scattering, SrLaMgTaO<sub>6</sub>, Double Perovskites, Light Emitting Diodes

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