

**Fabrication and photoluminescence of chemically stable $\text{La}_2\text{O}_3:\text{Eu}^{3+}/\text{La}_2\text{Sn}_2\text{O}_7$
core-shell-structured nanoparticles**

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Experimental procedure

Lanthanum diacetate hydroxide (LDAH) modified with europium and trifluoroacetate ions was precipitated in methanolic solutions of pertinent RE acetates and trifluoroacetic acid at 60°C. A molar ratio of La:Eu was fixed to 10:1. The precipitated LDAH powders were then dried at room temperature and subsequently heated at 600°C for 1 h to be converted into $\text{LaOF}:\text{Eu}^{3+}$ nanoparticles.

$\text{Na}_2\text{SnO}_3 \cdot 3\text{H}_2\text{O}$ was dissolved in an aqueous NaOH solution (pH = 10.5). The $\text{LaOF}:\text{Eu}^{3+}$ powders were added to the resultant Na_2SnO_3 solution and ultrasonicated for 10 min. The mixture was then heated at 60°C for 1 h under reflux. After cooling to room temperature, the powders were centrifuged, washed with ethanol, and dried. Final heat treatments were performed typically at 1000°C for 1 h in air to obtain the core-shell-structured nanoparticles.

Crystal structure identification was made by X-ray diffraction (XRD) with a Rigaku model RAD-C diffractometer using Cu $K\alpha$ radiation. Particle morphology was observed by transmission electron microscopy (TEM) with a Philips model TECNAI F20 microscope. Photoluminescence (PL) spectra were measured at room temperature with a Shimadzu model RF-5700PC using a Xe lamp (150 W) as an ultraviolet (UV) light source. Emission scans were performed with a 1.5 nm bandpass emission slit. An optical filter, which eliminated light having wavelengths smaller than 390 nm, was used to remove a second-order peak of the excitation light.

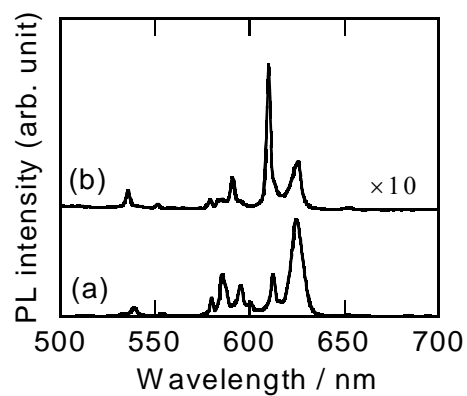


Fig. S1 PL spectra of (a) the $\text{La}_2\text{O}_3:\text{Eu}^{3+}/\text{La}_2\text{Sn}_2\text{O}_7$ powder and (b) the non-coated $\text{La}_2\text{O}_3:\text{Eu}^{3+}$ powder, aged under ambient atmosphere over 5 days. The non-coated powder was actually converted into $\text{La}(\text{OH})_3$ according to the XRD analysis, and exhibited very weak PL intensities.