Supporting information

Hyperbranched Microspheres Formed by EDTA-based Coordination Polymer with Ternary Architectures Assembled by Ultrathin Nanoribbons and Their Tricolor Luminescent Properties

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**Experimental Section**

**Synthesis.** All chemical regents are commercially available and were used as received. In a typical synthesis, 4 mmol disodium EDTA was dissolved in 24 ml H₂O at 45°C. 8 mmol rare earth salt (La(NO₃)₃•6H₂O, Ce(NO₃)₃•6H₂O, etc.) was added in the disodium EDTA solution above-mentioned under stirring, and several minutes later, some white precipitates were produced. Then the suspension obtained was transferred into 30 ml autoclave, sealed and heated under 160 °C for 24 hours. The as-prepared lanthanide coordination polymers (CPs) were washed by deionized water and absolute ethanol and dried in air under 60 °C.

**Characterizations.** The thermogravimetry and differential thermal analysis (TG-DTA) of the sample were performed on a Rigaku TG-DTA thermal analyzer. XRD patterns were recorded with a Rigaku D/max-2500 diffractometer. SEM was measured on Shimadzu SS-550 and Hitachi Model S-4800 instruments. TEM was measured by Philips Tecnai G² F20 instrument. AFM was measured by Veeco Metrology Nanoscope IIIa. XPS spectra were obtained with a Kratos Axis Ultra DLD spectrometer. Element analysis data were obtained with an Elementar Vanio-EL instrument. FTIR spectra were carried out on KBr pellets in a BRUKER VECTOR 22 spectrometer.
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<th>Without Hydrothermal Treatment</th>
<th>Hydrothermal Treatment 6h</th>
<th>Hydrothermal Treatment 12h</th>
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**Table S1** EA analysis data of La-EDTA CPs obtained by (column a) without hydrothermal treatment and after 6 h (column b), 12 h reaction (column c) at 160 °C with the molar ratio of EDTA-2Na: La$^{3+}$=4: 8, and the La$^{3+}$ is 8 mmol.
**Fig. S1** Low resolution SEM image of Ce-EDTA hyperbranched microspheres assembled by ultrathin nanoribbons.
**Fig. S2** The high resolution SEM image of nanoribbons of Ce-EDTA coordination polymers (CPs).
Fig. S3 TEM images of multi-layer nanoribbons of La-EDTA CPs.
**Fig. S4** TEM image of ultrathin nanoribbon of La-EDTA CPs in Figure 1d after radiation of electrons for several seconds.
Fig. S5 An optical photo of La-EDTA CPs as-prepared products.
Fig. S6 The XRD pattern of La-EDTA CPs products obtained after 24 h reaction at 160 °C, with the molar ratio of EDTA-2Na: La$^{3+}$=4: 8, and the La$^{3+}$ is 8 mmol.
Fig. S7 The FTIR spectra of (a) La-EDTA coordination polymers obtained after 24 h reaction at 160 °C with the molar ratio of EDTA-2Na: La$^{3+}$=4: 8, and the La$^{3+}$ is 8 mmol; (b) Pure EDTA-2Na ligands (C$_{10}$H$_{14}$N$_2$O$_8$Na$_2$·2H$_2$O).
Fig. S8 The XPS spectrum of La-EDTA CPs obtained after 24 h reaction at 160 °C with the molar ratio of EDTA-2Na: La\(^{3+}\)=4: 8, and the La\(^{3+}\) is 8 mmol.
Fig. S9 The TGA curve of La-EDTA CPs obtained after 24 h reaction at 160 °C with the molar ratio of EDTA-2Na: La^{3+}=4: 8, and the La^{3+} is 8 mmol.
**Fig. S10** SEM images of La-EDTA CPs obtained (a) without hydrothermal treatment. After 2 h(b), 6 h(c), 8 h(d) and 12 h(e, f) reaction at 160 °C with the molar ratio of EDTA-2Na: La$^{3+}$=4: 8, and the La$^{3+}$ is 8 mmol.
Fig. S11 The XRD patterns of La-EDTA CPs obtained (a) without hydrothermal treatment. (b) After 6 h. The arrows pointed out the “coordination polymers A” in intermediate state. (c) After 2 h reaction at 160 °C with the molar ratio of EDTA-2Na: La$^{3+}$=4: 8, and the La$^{3+}$ is 8 mmol.