Supporting information

**Figure S1** TG and DSC curves of WR–IM$^+$[Eu(TTA)$_4$]$^-$.  

![TG and DSC curves](image)

As shown in Figure S2, the selected WR–IM$^+$[Eu(TTA)$_4$]$^-$ shows a two-step weight loss approach over 195 °C according to the DTG and the DSC curves. The weight loss between 195 and 360 °C could be associated with the decomposition of europium tetrakis(β-diketonate) attaching onto the polymer matrices.

**Figure S2** Emission spectra of the Poly(St-HEMA) matrix (A), europium tetrakis(TAA) complexes treated Poly(St-HEMA) (B), samarium tetrakis(TAA) complexes treated Poly(St-HEMA) (C), and terbium tetrakis(TAA) complexes treated Poly(St-HEMA) (D). The excitation wavelength for the emission spectra are 365, 323, 315 and 325 nm for A, B, C and D, respectively. All the Poly(St-HEMA) used here are unmodified by the imidazolium.
Figure S3 XRD patterns for the selected polymers.

Figure S4 The diffuse reflectance UV-Vis spectra for Poly(St-HEMA)-based materials (A) and WR-based materials (B).

Figure S5 The luminescence lifetime decay curves of materials (A) WR–IM⁺[Eu(TTA)₄]⁻ and (B) poly(St-HEMA)–IM⁺[Tb(TTA)₄]⁻. Curves fit to a single exponential.