Supplement information

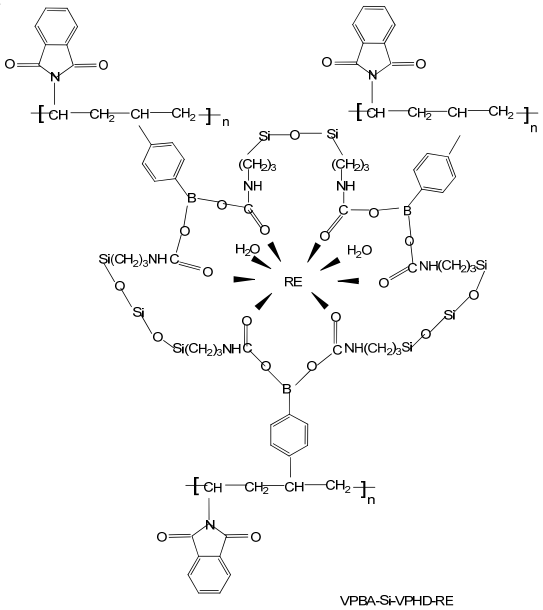

Figure S1 The scheme for the synthesis process of the hybrid material VPBA-Si-VPHD-RE

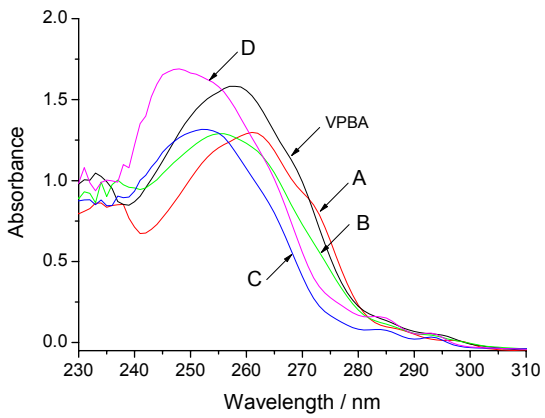

Figure S2 The ultraviolet absorption spectra of the raw material VPBA and the precursors raw material VPBA and Precursor A (VPBA-Si), Precursor B (VPBA-Si-TSLA), Precursor C (VPBA-Si-VPHD) and Precursor D (TSLA-Si-VTMS).

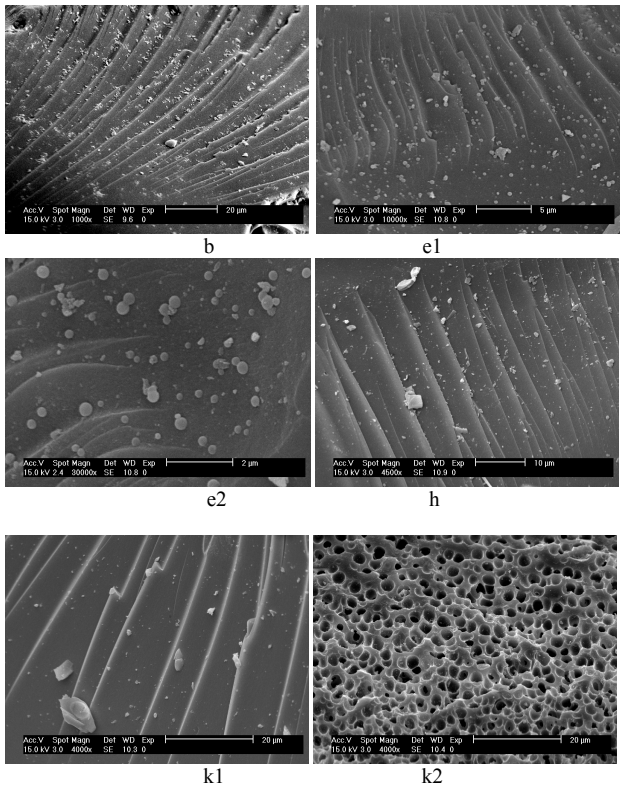

Figure S3 SEM images of the hybrid materials (b, e, h, k for hybrids VPBA-Si-Eu, VPBA-Si-TSLA-Eu, VPBA-Si-VPHD-Eu, TSLA-Si-VTMS-Eu)

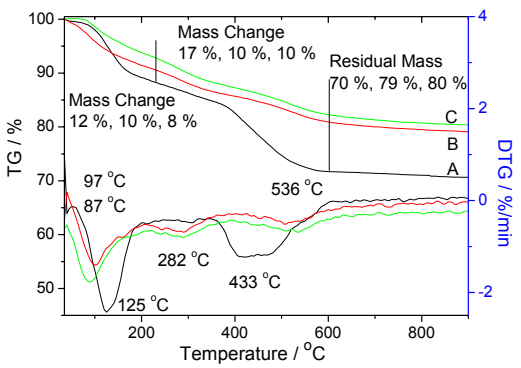

Figure S4 The thermogravimetry (TG) and differential thermogravimetry (DTG) traces of the hybrids VPBA-Si without lanthanide ion (A black line), and hybrids with europium ions VPBA-Si-Eu (B red line), VPBA-Si-TSLA-Eu (C green line)

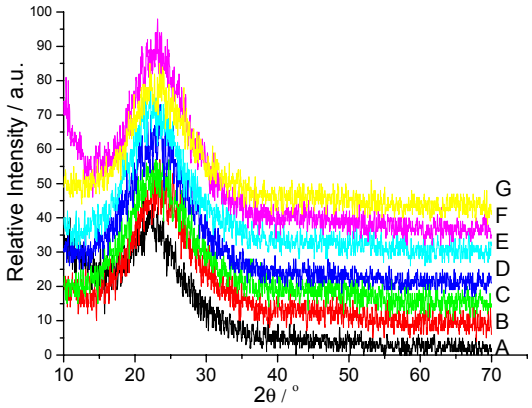

Figure S5 The X-rays diffraction (XRD) graphs of the hybrid materials without center ions VPBA-Si-TSLA (A), VPBA-Si-VPHD (D), TSLA-Si-VTMS (F) and the hybrids with europium ions (VPBA-Si- (B) / VPBA-Si-TSLA (C) / VPBA-Si-VPHD (E), TSLA-Si-VTMS (G)

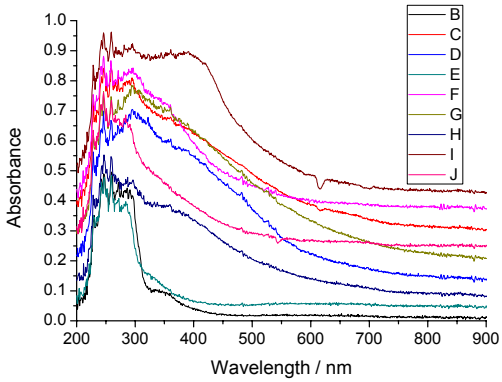

Figure S6 The ultraviolet-visible diffuse reflection absorption spectra of the hybrid polymeric materials (A, B, and C for the hybrid without the centre rare-earth ion VPBA-Si-TSLA, VPBA-Si-VPHD and TSLA-Si-VTMS, D, E, F, G, H, I for the hybrid with the center rare-earth ions (VPBA-Si-TSLA-Tb^{3+}/Eu^{3+}, VPBA-Si-VPHD-Tb^{3+}/Eu^{3+}, TSLA-Si-VTMS-Tb^{3+}/Eu^{3+})

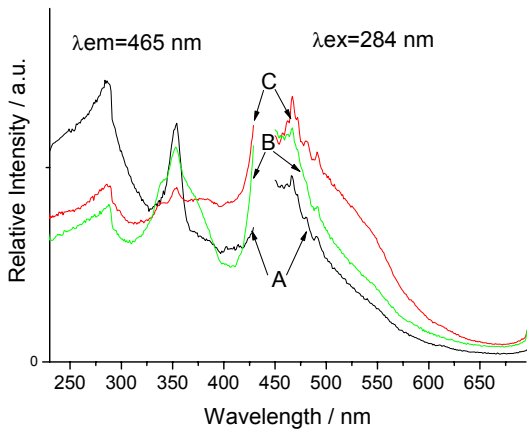

Figure S7 The excitation and emission spectra of the hybrid materials without rare-earth ion (A for VPBA-Si-TSLA, VPBA-Si-VPHD, TSLA-Si-VTMS)