Synthesis P1-Si and P2-Si precursors 10 mmol (2.000 g) PEG200 or 10 mmol (1.602 g) bis(2-hydroxyethyl)ether (BHE) was dissolved into 15 mL dehydrated toluene solvent in a covered flask and then dispersed completely. 3-cyanatopropyltriethoxysilane (TEPIC, 20 mmol/4.947 g) was added drop by drop into the solution, which is stirred and heated to 85 °C for 12 hrs under protection of nitrogen atmosphere. The viscous liquids were obtained through removing the solvent by rotary vacuum evaporator and the crude products were washed with hexane for three times. After purification, PEG-Si or BHE-Si was finally obtained. HNMR (DMSO-d^6, 400 MHz): PEG-Si δ4.36(4H, t), δ7.53(2H, t), δ2.68(4H, m), δ2.35(4H, m), δ1.22(4H, t), δ1.12(18H, t), δ3.65(12H, m). BHE-Si: HNMR δ3.46(4H, t), δ4.37(4H, t), δ7.61(2H, t), δ3.40(4H, m), δ3.29(4H, m), δ1.05(4H, t), δ3.42(12H, m), δ1.06(18H, t).

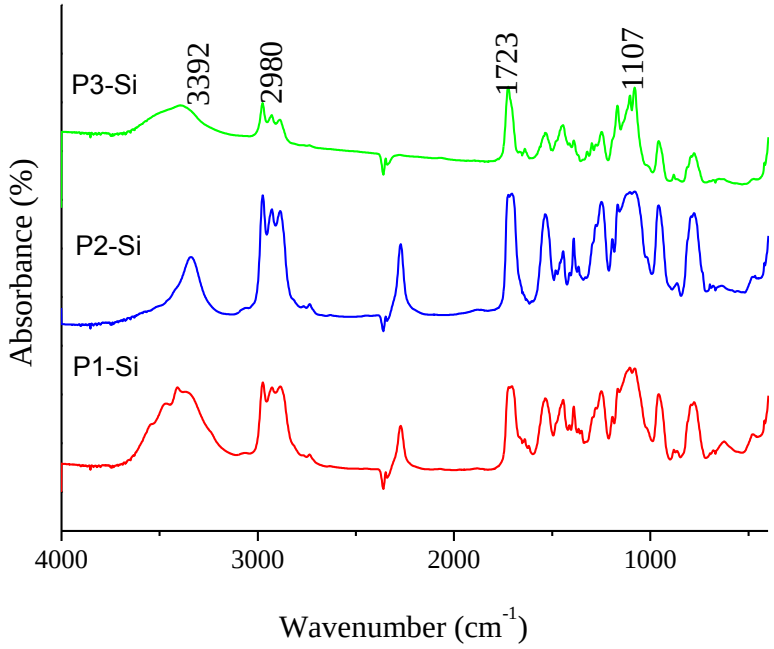

Figure S1 The FT-IR spectra of polymer modified silanes

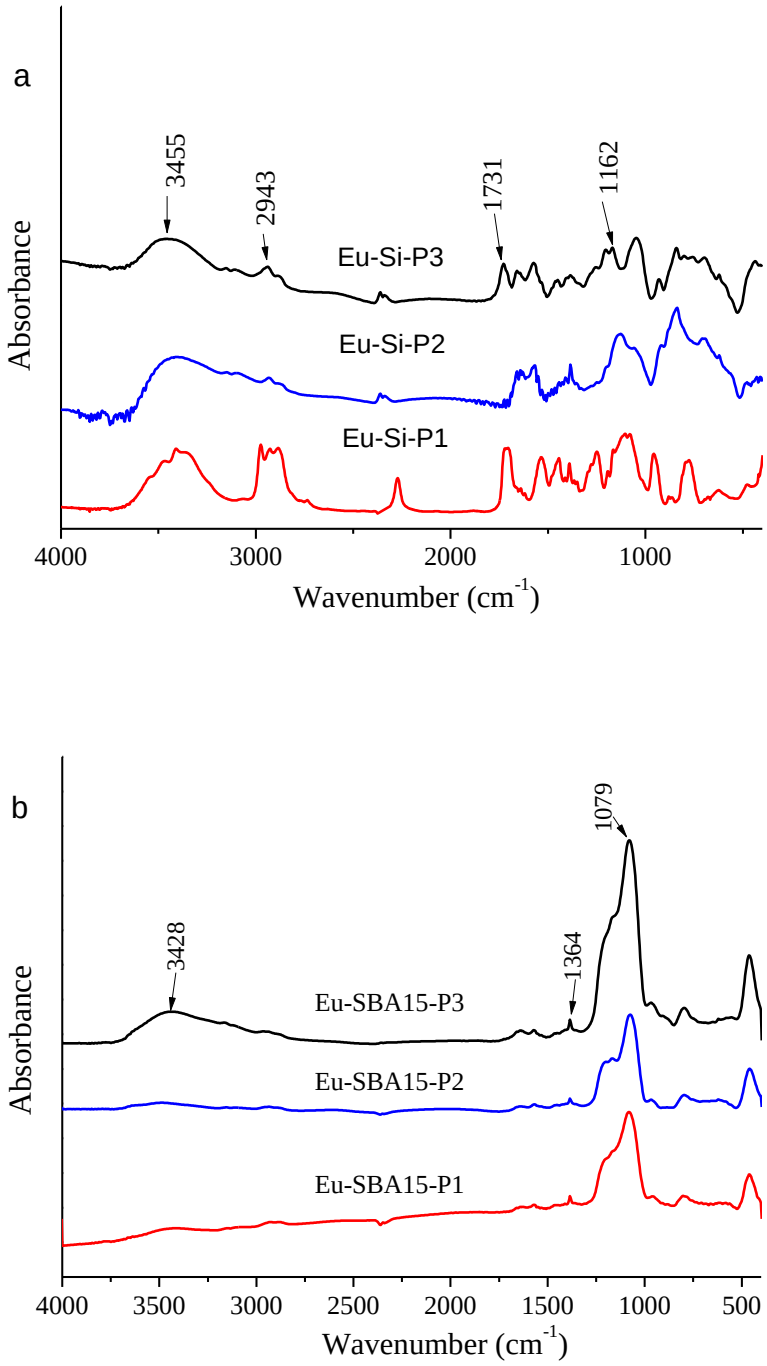

Figure S2 FT-IR spectra of multi-component hybrids annealed to 250 °C: (a) Eu-Si-P1(2,3); (b) Eu-SBA15-P1(2,3).

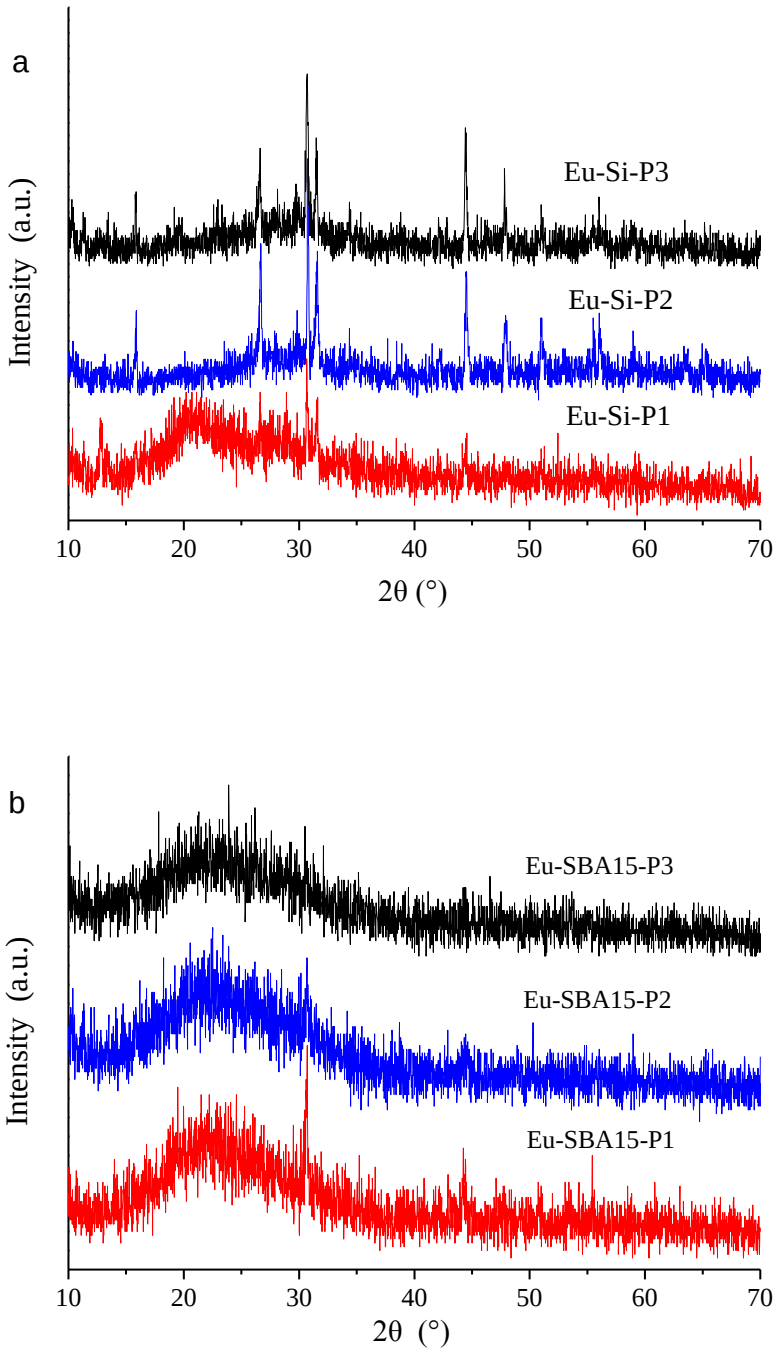

Figure S3 XRD patterns of multi-component hybrids (a) Eu-Si-P1(2,3); (b) Eu-SBA15-P1(2,3).

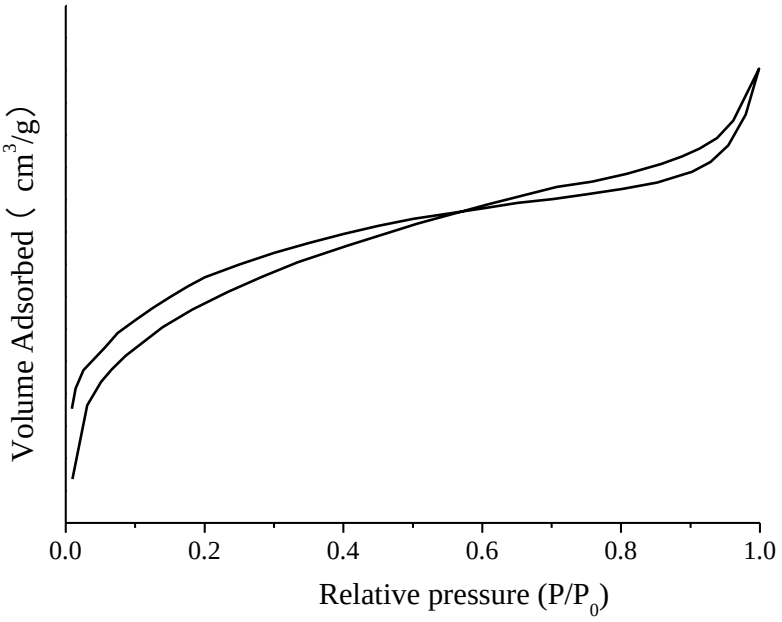

Figure S4 The N_2 adsorption and desorption isotherms of EuW10

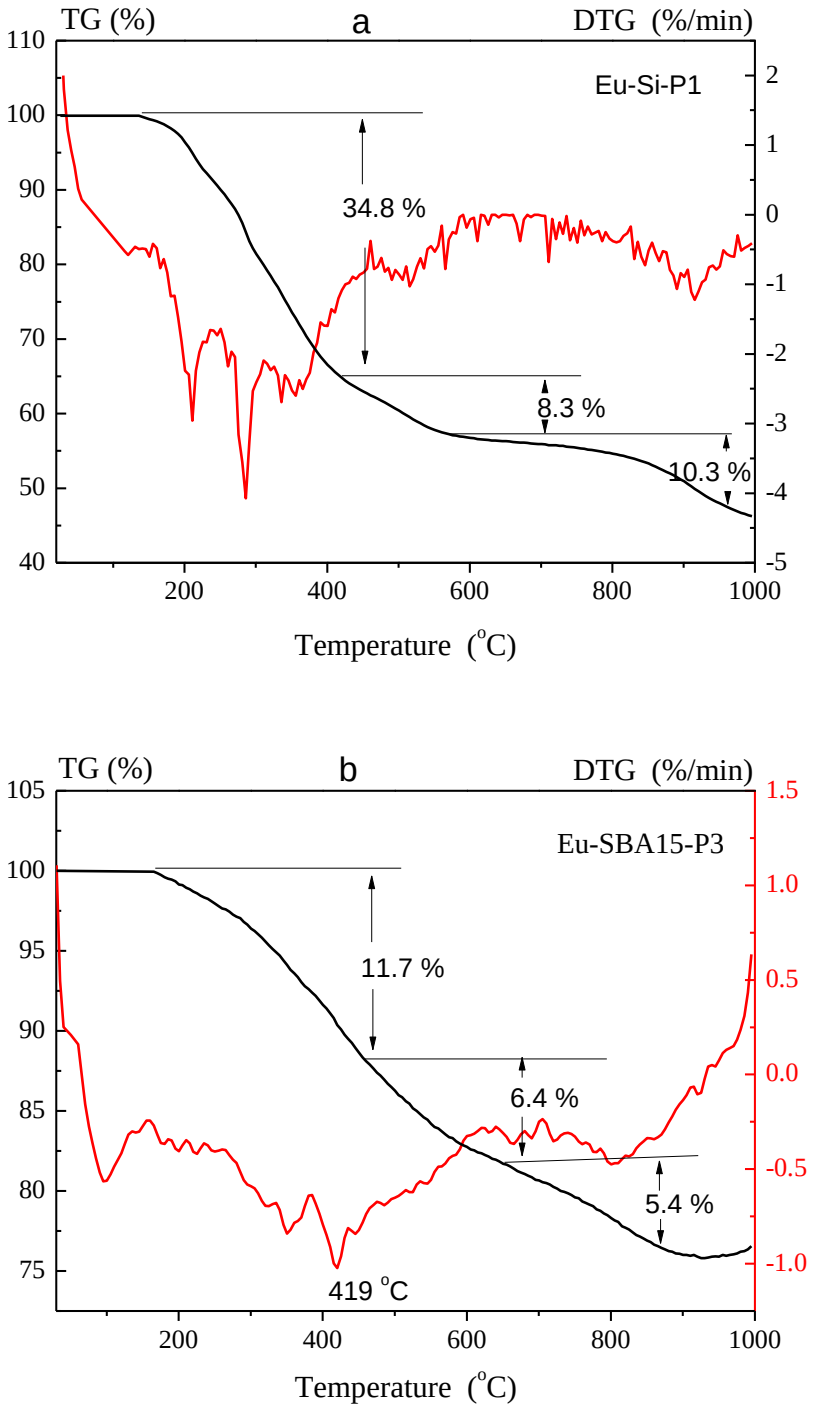

Figure S5 The selected thermogravimetric (TG-DTG) curves of Eu-Si-P1 (a) and Eu-SBA15-P3 (b) hybrid materials annealed to 250 °C

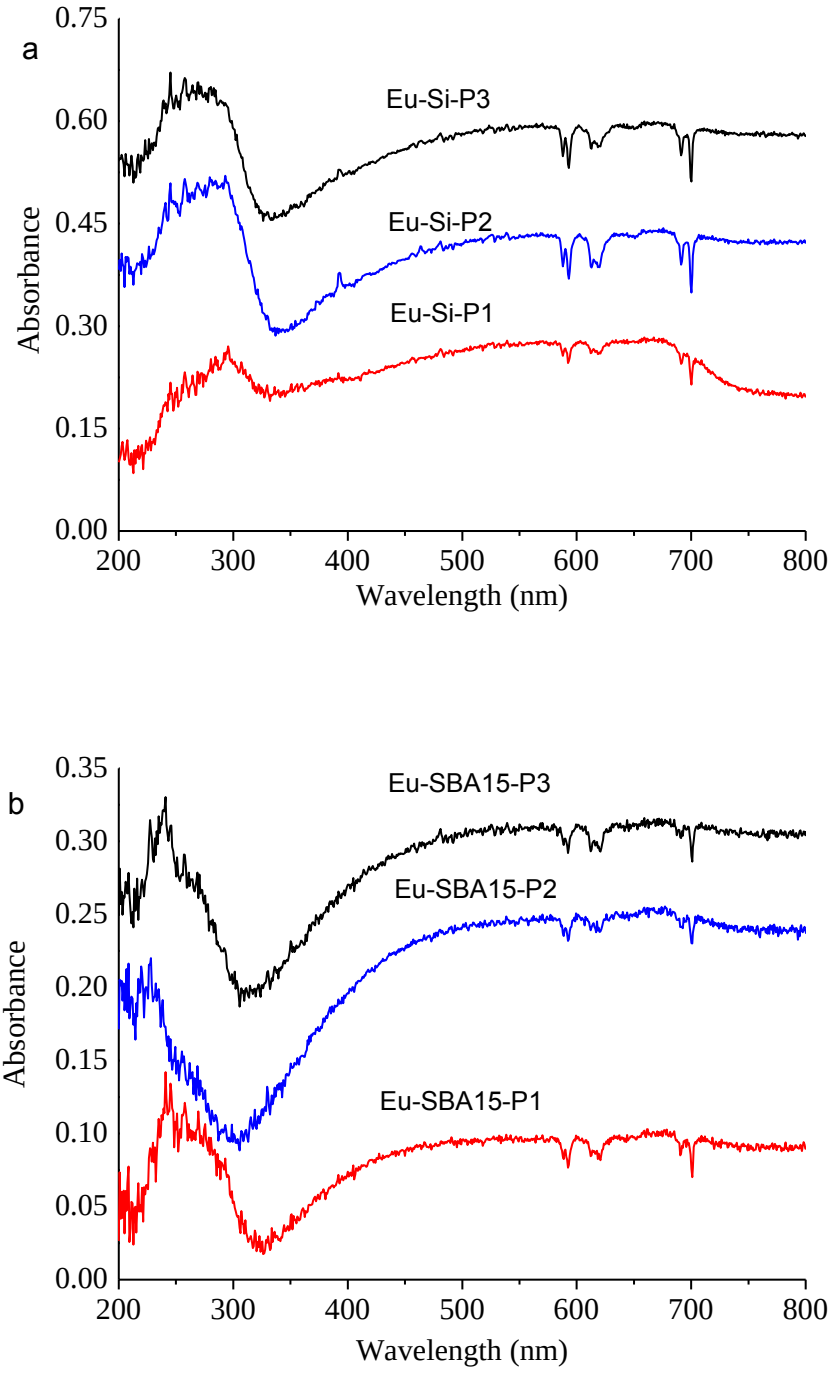

Figure S6 Diffuse reflection spectra of Eu -Si-P1(2,3) and Eu-SBA15-P1(2,3) hybrid materials.

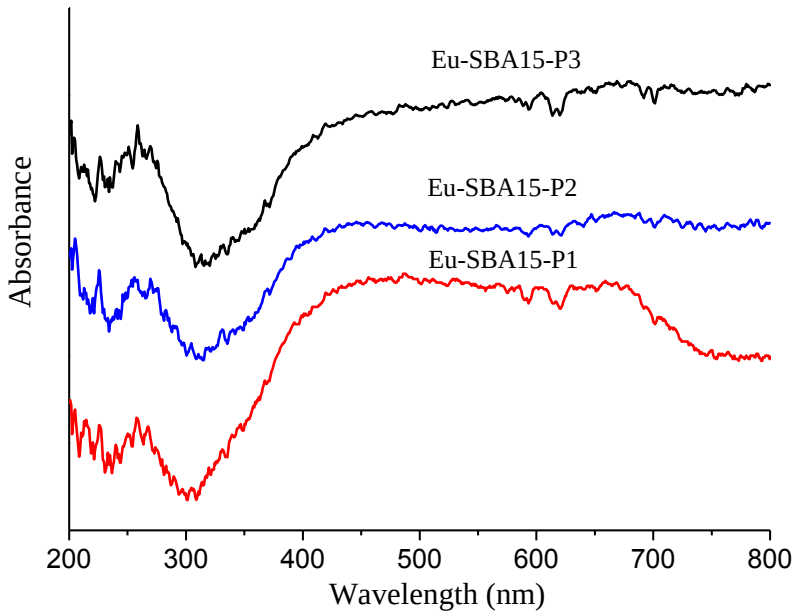

Figure S7 Selected diffuse reflection spectra of Eu-SBA15-P1(2,3) hybrid materials annealed to 250 ^{o}C