Electronic Supplementary Information (ESI)

An intensive green emitting terbium complex using a newly designed aromatic hyperbranched polyester as efficient antenna ligand

Dan Liu,[*a] Yin-Ning Zhou,[b] Jilian Zhao,[c] Yaling Xu,[a] Jingfei Shen[a] and Minggang Wu[a]

[a] *College of Biological, Chemical Sciences and Engineering, Jiaxing University, Jiaxing, 314001, P. R. China. Email: liudan1029@126.com*

[b] *Department of Chemical Engineering, School of Chemistry and Chemical Engineering, Shanghai Jiao Tong University, Shanghai, 200240, P. R. China*

[c] *PetroChina Jilin Petrochemical Company Synthetic Resin Factory, Jilin, 132021, P. R. China*

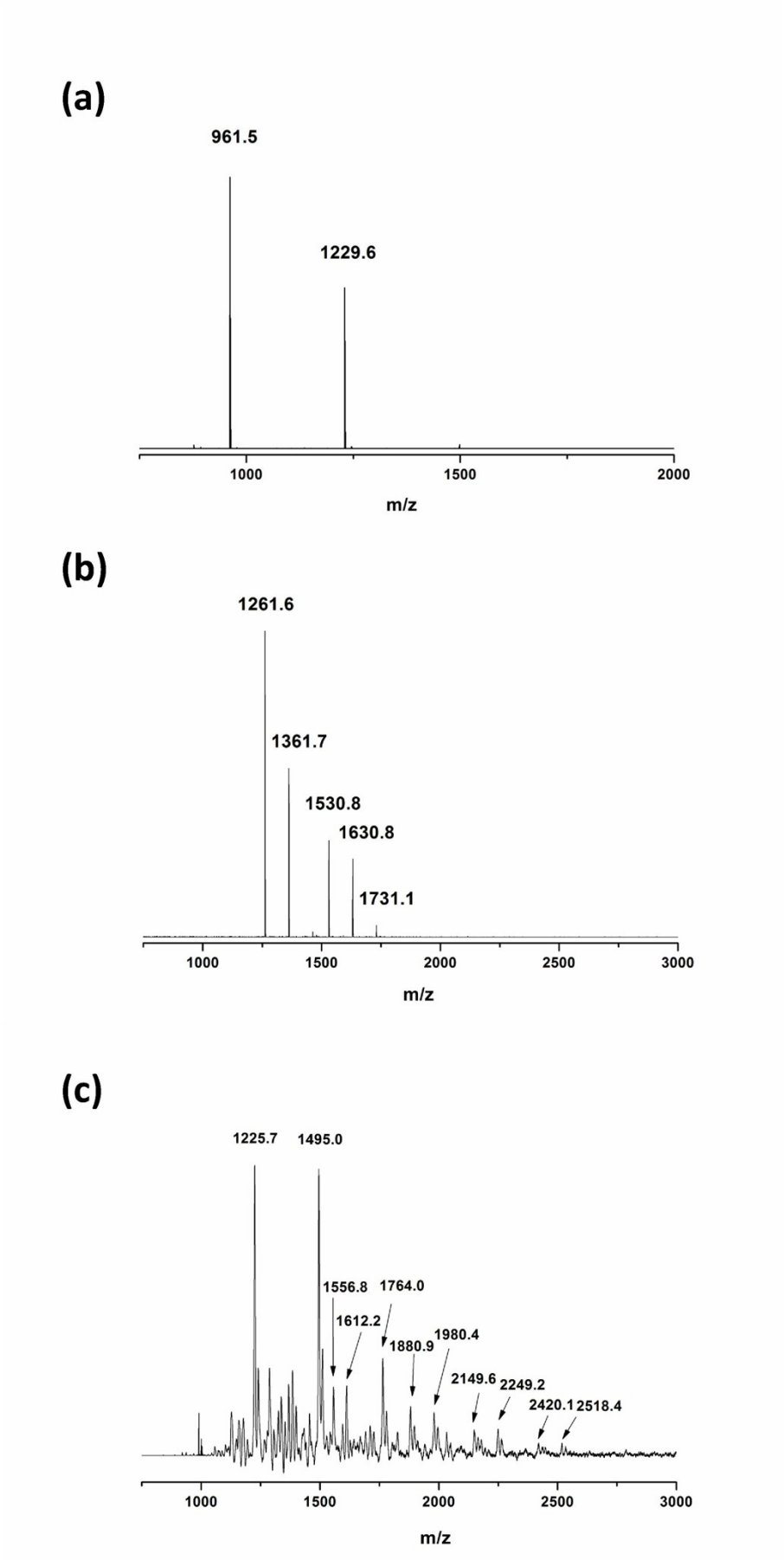

Fig. S1 MALDI-TOF mass spectra of (a) HBPE, (b) CHBPE and (c) CHBPE-Tb^{3+}-Phen.

Fig. S1a shows that HBPE is consisted of two molecular structures with different amount of hydroxyl end-groups as follows: six hydroxyl end-groups (m/z=961.5 [M+Na^+]) and seven hydroxyl end-groups (m/z=1229.6 [M+Na^+]).

Fig. S1b shows that CHBPE is consisted of five molecular structures with different amount of hydroxyl and carboxyl end-groups as follows: three hydroxyl end-groups and three carboxyl end-groups (m/z=1261.6 [M+Na^+]), two hydroxyl end-groups and four carboxyl end-groups (m/z=1361.7 [M+Na^+]), four hydroxyl end-groups and three carboxyl end-groups (m/z=1530.8 [M+Na^+]), three hydroxyl end-groups and four carboxyl end-groups (m/z=1630.8 [M+Na^+]), and two hydroxyl end-groups and five carboxyl end-groups (m/z=1731.1 [M+Na^+]).

Compared to CHBPE, the MALDI-TOF MS of CHBPE-Tb^{3+}-Phen shows more mass signals in the higher m/z regions, suggesting that there is complexation between Tb^{3+} and ligands.

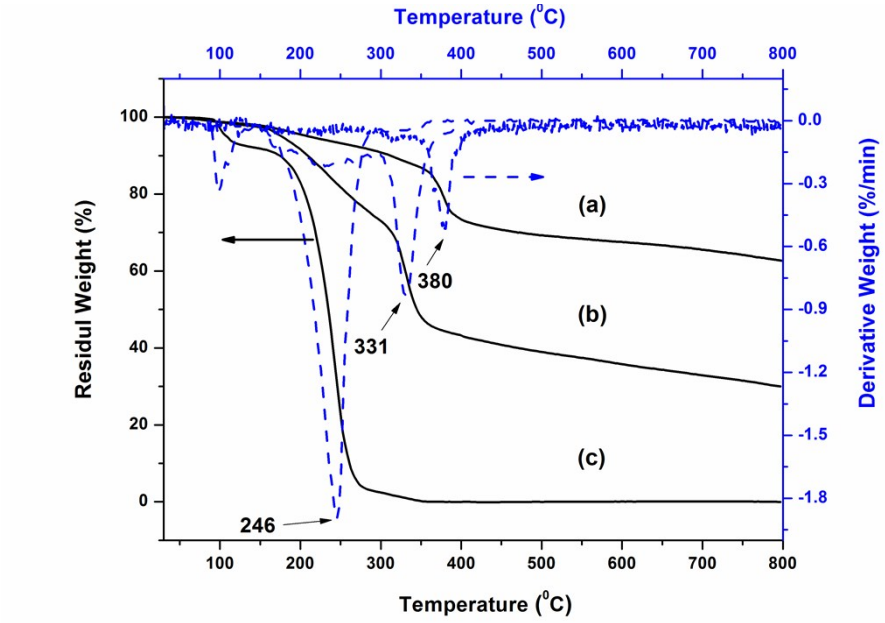

Fig. S2 TGA and DTG curves (a) CHBPE-Tb^{3+}-Phen, (b) CHBPE and (c) Phen·H_2O.

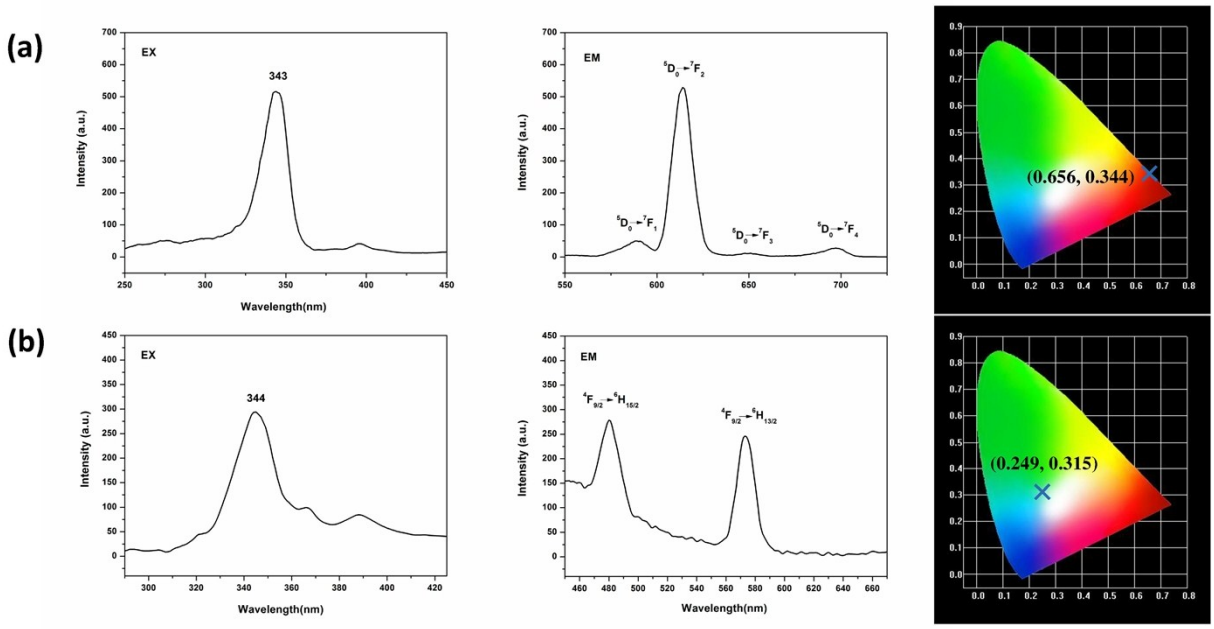

Fig. S3 Excitation, emission spectra and CIE 1931 chromaticity diagrams of (a) CHBPE-Eu^{3+}-Phen and (b) CHBPE-Dy^{3+}-Phen. The concentration of the complexes in DMF was 1×10^{-4} mol/L.

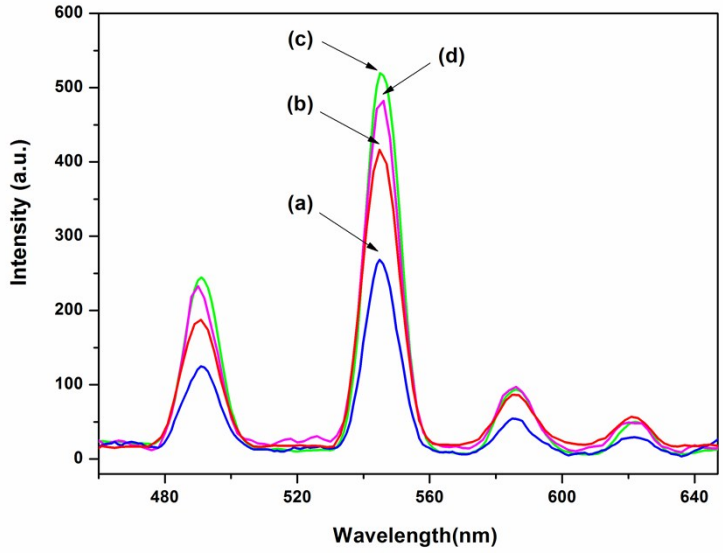

Fig. S4 Emission spectra of CHBPE-Tb^{3+}-Phen with the molar ratio of CHBPE to Phen of (a) 1:1, (b) 1:2, (c) 1:3 and (d) 1:4. The excitation wavelengths were 333 nm, 336 nm, 336 nm and 334 nm, respectively. The concentration of all the samples in DMF was 1×10^{-4} mol/L.

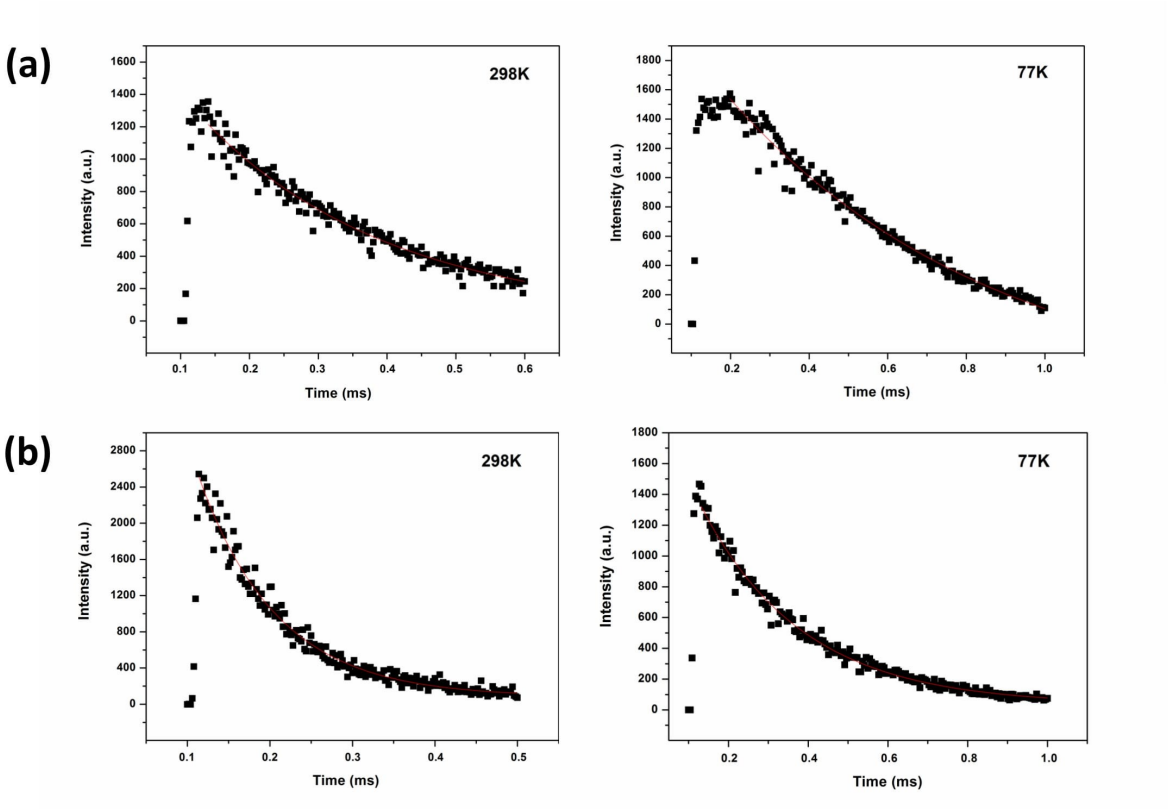

Fig. S5 Luminescence decay profiles of (a) CHBPE-Tb^{3+}-Phen and (b) CHBPE-Tb^{3+} in the solid states at 298K and 77K, respectively.

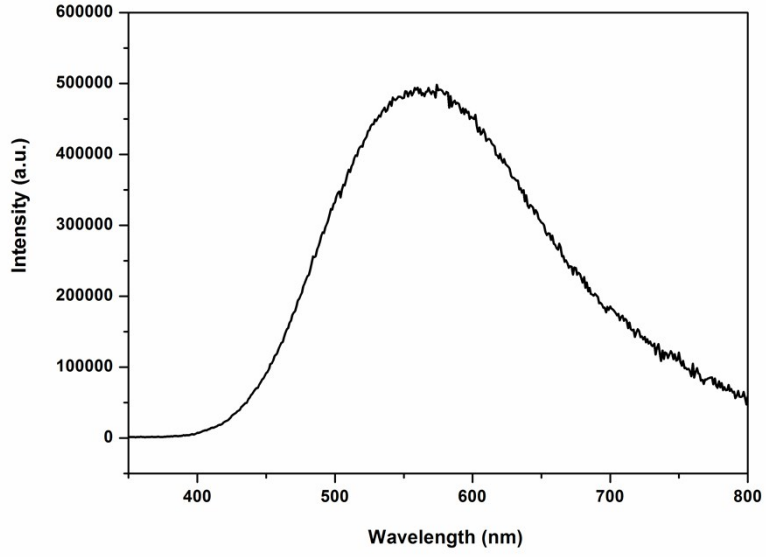

Fig. S6 Phorsphorescence of CHBPE-Gd^{3+} in the solid state at 77K.