

Syntheses, crystal structure and photophysical properties of [Sm(dbm)₃(impy)] and [Tb(dbm)₃(impy)] and their hybrid films

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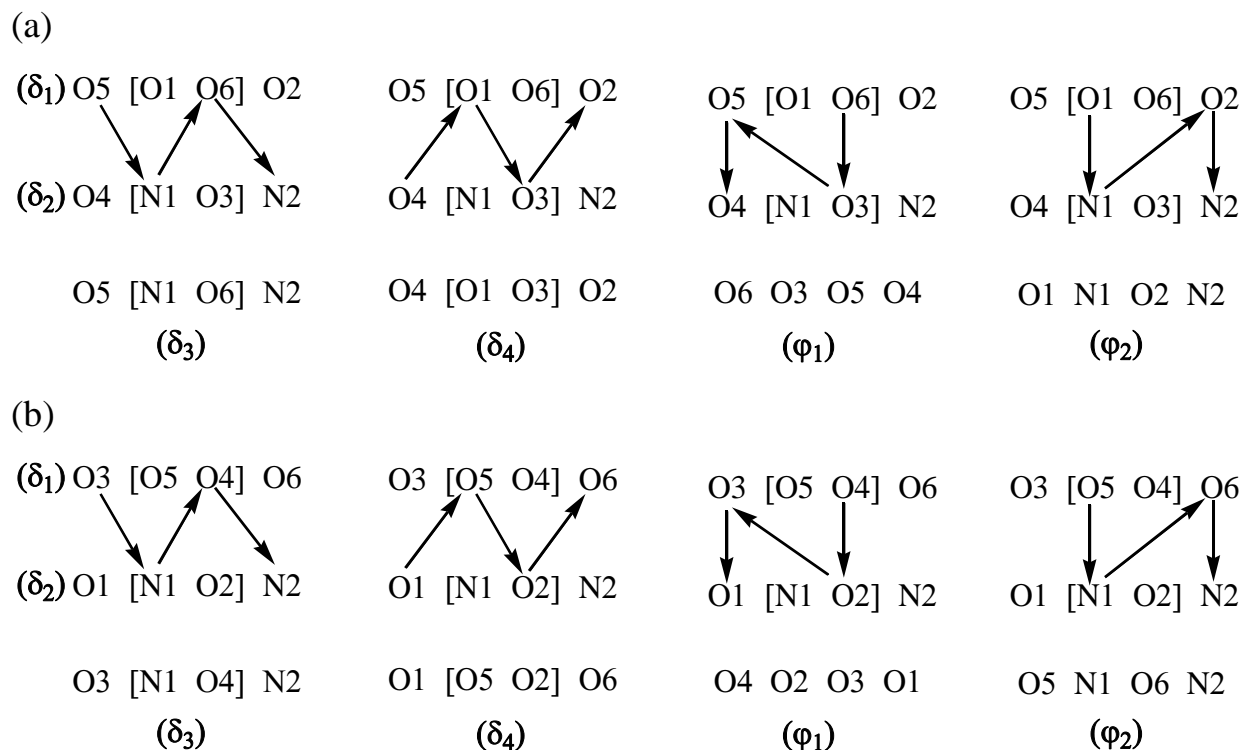
Supplementary information

Table S1. Selected bond lengths and angles for the complex **1**

Bond	Bond length (Å)	Bond	Bond angle (°)	Bond	Bond angle (°)
N(1)-Sm(1)	2.559(3)	O(3)-Sm(1)-O(4)	71.68(8)	O(2)-Sm(1)-O(6)	74.37(9)
N(2)-Sm(1)	2.645(3)	O(3)-Sm(1)-O(1)	92.77(9)	O(3)-Sm(1)-N(1)	99.04(9)
O(1)-Sm(1)	2.358(2)	O(4)-Sm(1)-O(1)	80.39(9)	O(4)-Sm(1)-N(1)	75.36(9)
O(2)-Sm(1)	2.377(2)	O(3)-Sm(1)-O(5)	150.72(8)	O(1)-Sm(1)-N(1)	147.97(8)
O(3)-Sm(1)	2.347(2)	O(4)-Sm(1)-O(5)	80.03(8)	O(5)-Sm(1)-N(1)	80.53(9)
O(4)-Sm(1)	2.351(2)	O(1)-Sm(1)-O(5)	74.88(9)	O(2)-Sm(1)-N(1)	139.97(8)
O(5)-Sm(1)	2.365(2)	O(3)-Sm(1)-O(2)	85.49(9)	O(6)-Sm(1)-N(1)	76.95(9)
O(6)-Sm(1)	2.399(2)	O(4)-Sm(1)-O(2)	141.76(9)	O(3)-Sm(1)-N(2)	69.99(8)
		O(1)-Sm(1)-O(2)	70.27(8)	O(4)-Sm(1)-N(2)	116.05(8)
		O(5)-Sm(1)-O(2)	113.78(9)	O(1)-Sm(1)-N(2)	148.73(9)
		O(3)-Sm(1)-O(6)	139.47(8)	O(5)-Sm(1)-N(2)	131.85(8)
		O(4)-Sm(1)-O(6)	141.43(8)	O(2)-Sm(1)-N(2)	82.19(8)
		O(1)-Sm(1)-O(6)	112.04(10)	O(6)-Sm(1)-N(2)	72.65(9)
		O(5)-Sm(1)-O(6)	69.32(8)	N(1)-Sm(1)-N(2)	62.81(8)

Table S2. Selected bond lengths and angles for the complex **2**

Bond	Bond length (Å)	Bond	Bond length (Å)	Bond	Bond length (Å)
N(1)-Tb(1)	2.515(2)	O(2)-Tb(1)-O(1)	72.71(7)	O(6)-Tb(1)-O(4)	73.68(8)
N(2)-Tb(1)	2.608(2)	O(2)-Tb(1)-O(5)	91.43(8)	O(2)-Tb(1)-N(1)	99.61(8)
O(1)-Tb(1)	2.322(2)	O(1)-Tb(1)-O(5)	79.59(8)	O(1)-Tb(1)-N(1)	74.96(8)
O(2)-Tb(1)	2.310(2)	O(2)-Tb(1)-O(3)	150.54(8)	O(5)-Tb(1)-N(1)	147.66(7)
O(3)-Tb(1)	2.330(2)	O(1)-Tb(1)-O(3)	79.05(8)	O(3)-Tb(1)-N(1)	80.61(8)
O(4)-Tb(1)	2.368(2)	O(5)-Tb(1)-O(3)	75.18(8)	O(6)-Tb(1)-N(1)	139.66(8)
O(5)-Tb(1)	2.325(2)	O(2)-Tb(1)-O(6)	84.79(8)	O(4)-Tb(1)-N(1)	77.43(8)
O(6)-Tb(1)	2.340(2)	O(1)-Tb(1)-O(6)	142.50(8)	O(2)-Tb(1)-N(2)	70.17(8)
		O(5)-Tb(1)-O(6)	71.22(7)	O(1)-Tb(1)-N(2)	116.98(7)
		O(3)-Tb(1)-O(6)	114.23(8)	O(5)-Tb(1)-N(2)	148.00(8)
		O(2)-Tb(1)-O(4)	138.96(7)	O(3)-Tb(1)-N(2)	132.47(8)
		O(1)-Tb(1)-O(4)	141.37(7)	O(6)-Tb(1)-N(2)	80.95(7)
		O(5)-Tb(1)-O(4)	113.04(8)	O(4)-Tb(1)-N(2)	72.19(8)
		O(3)-Tb(1)-O(4)	70.18(8)	N(1)-Tb(1)-N(2)	63.61(8)

**Figure S1.** Schematic representation of the dihedral planes (a) complex **1** and (b) complex **2**.

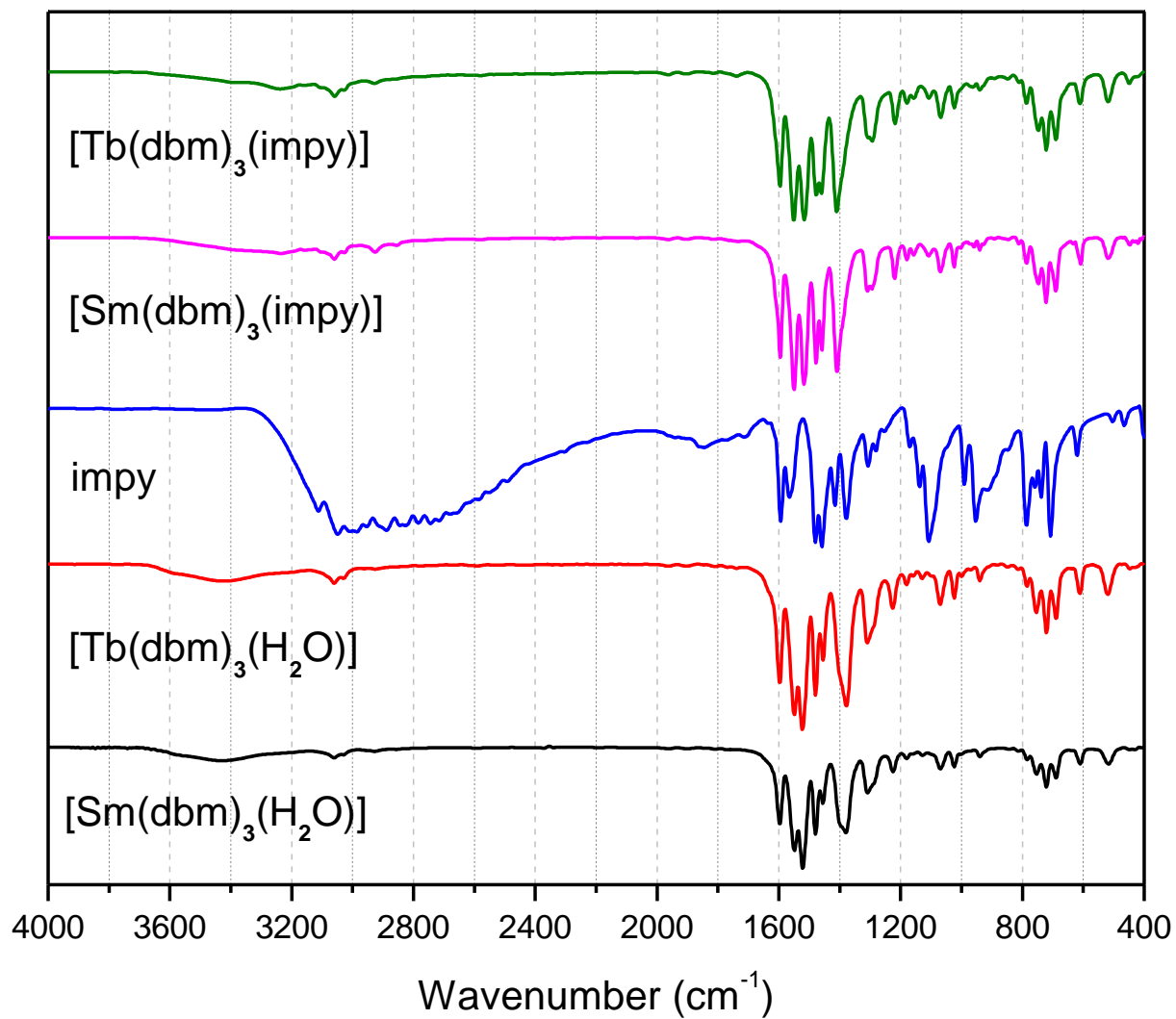
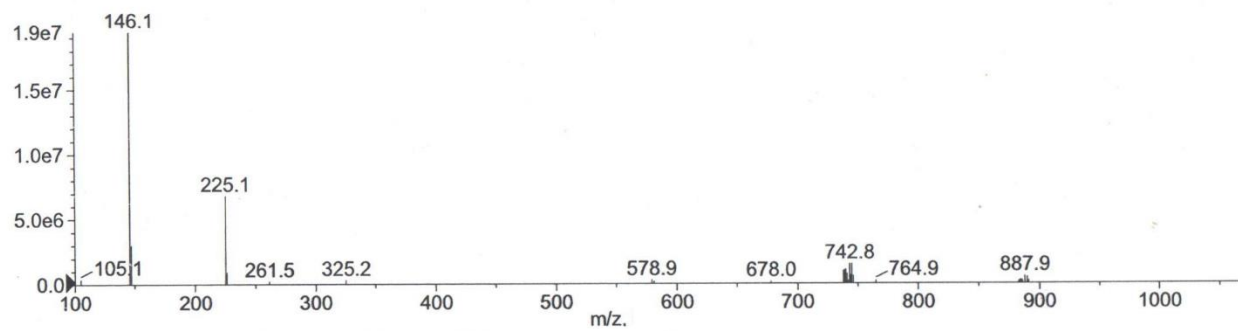


Figure S2. IR spectra of free impy, [Sm(dbm)₃(H₂O)], [Tb(dbm)₃(H₂O)], [Sm(dbm)₃(imp)] and [Tb(dbm)₃(imp)].

(a)



(b)

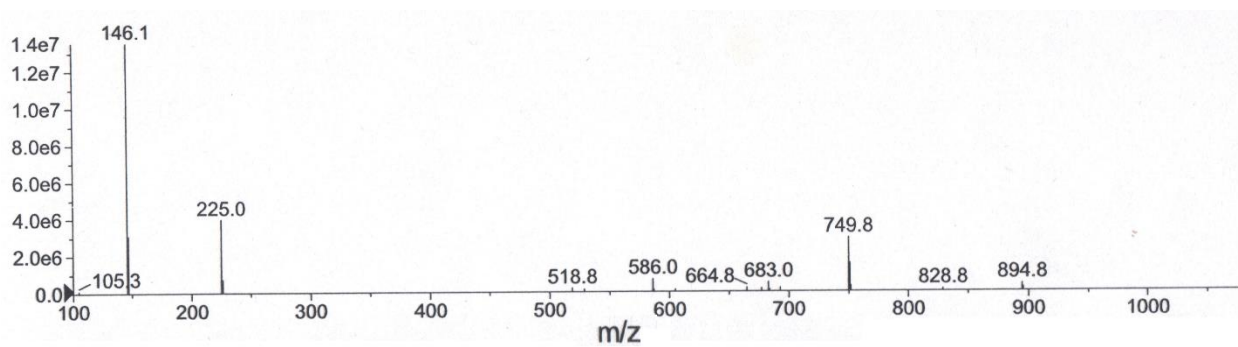


Figure S3. ESI-MS⁺ spectra of (a) [Sm(dbm)₃(imp)] and (b) [Tb(dbm)₃(imp)].

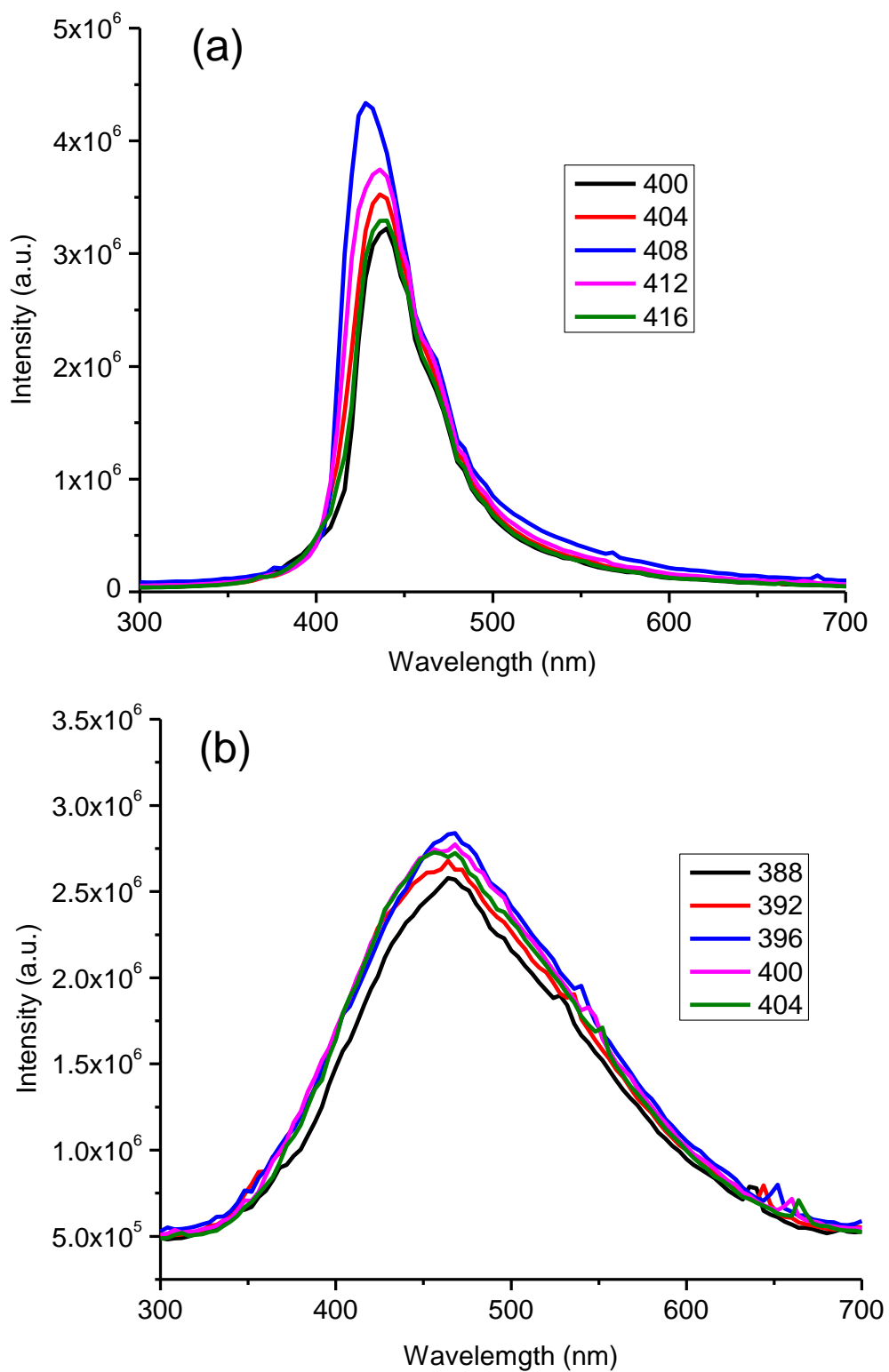
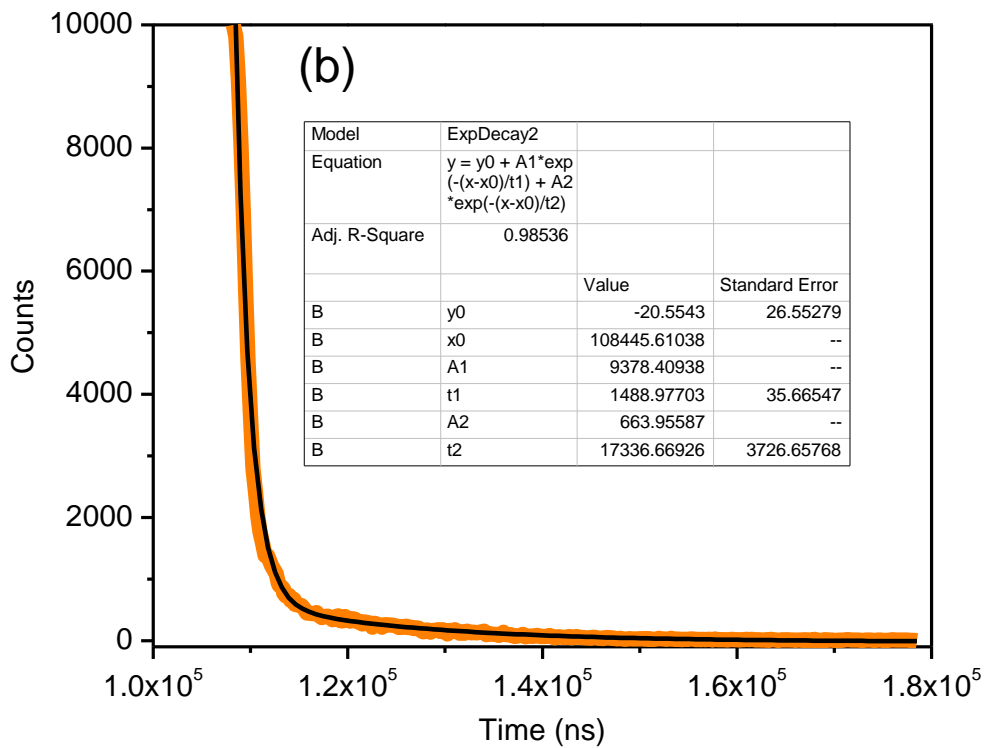
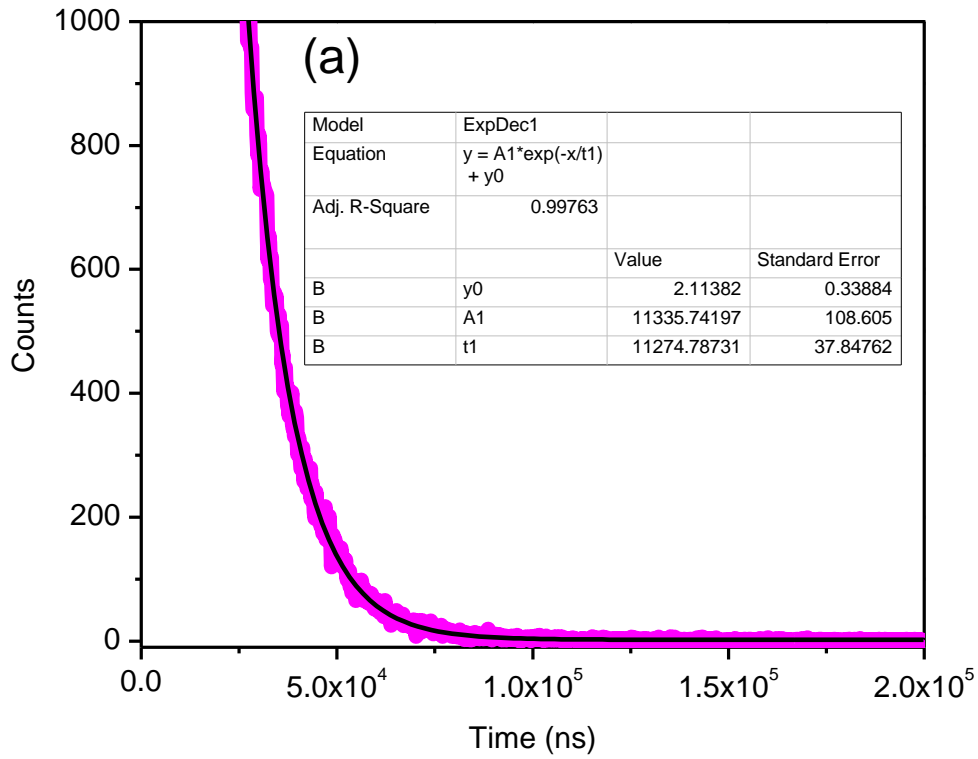


Figure S4. Emission spectra of (a) Hdbm and (b) impy



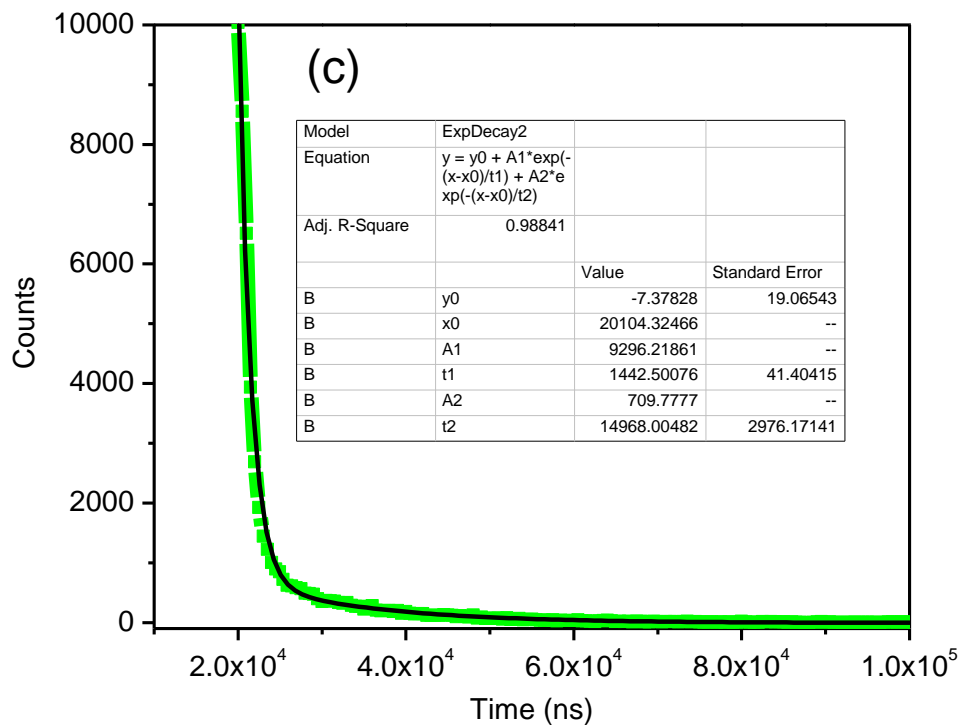
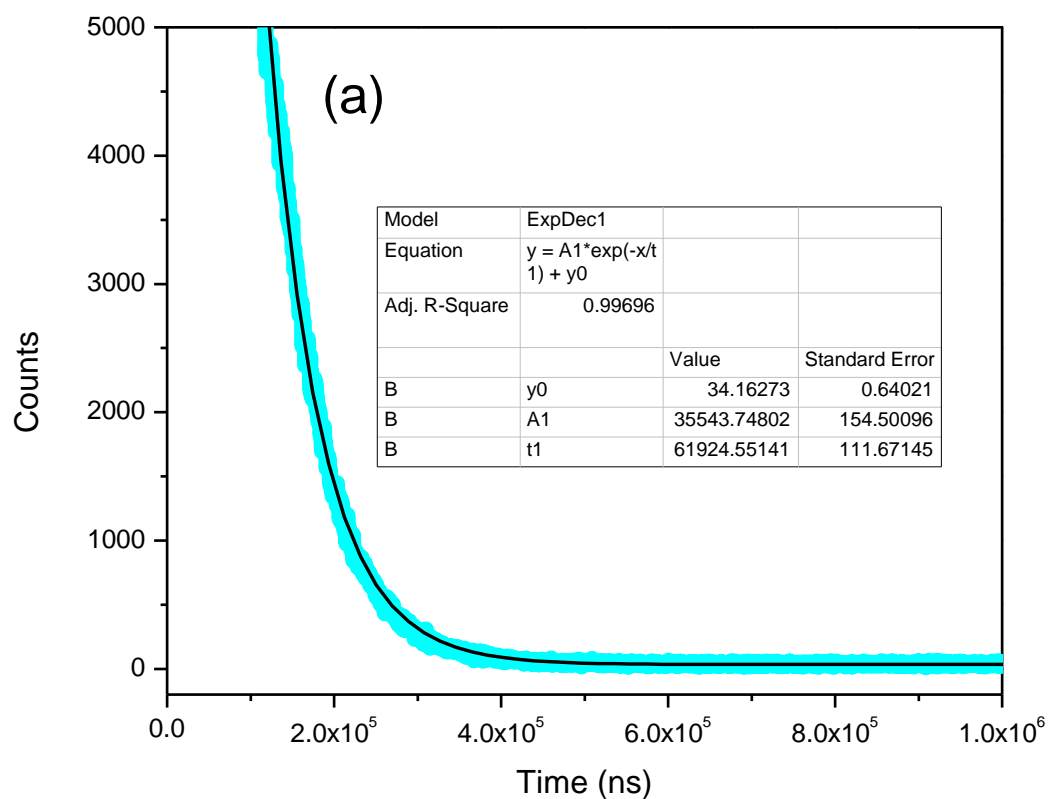
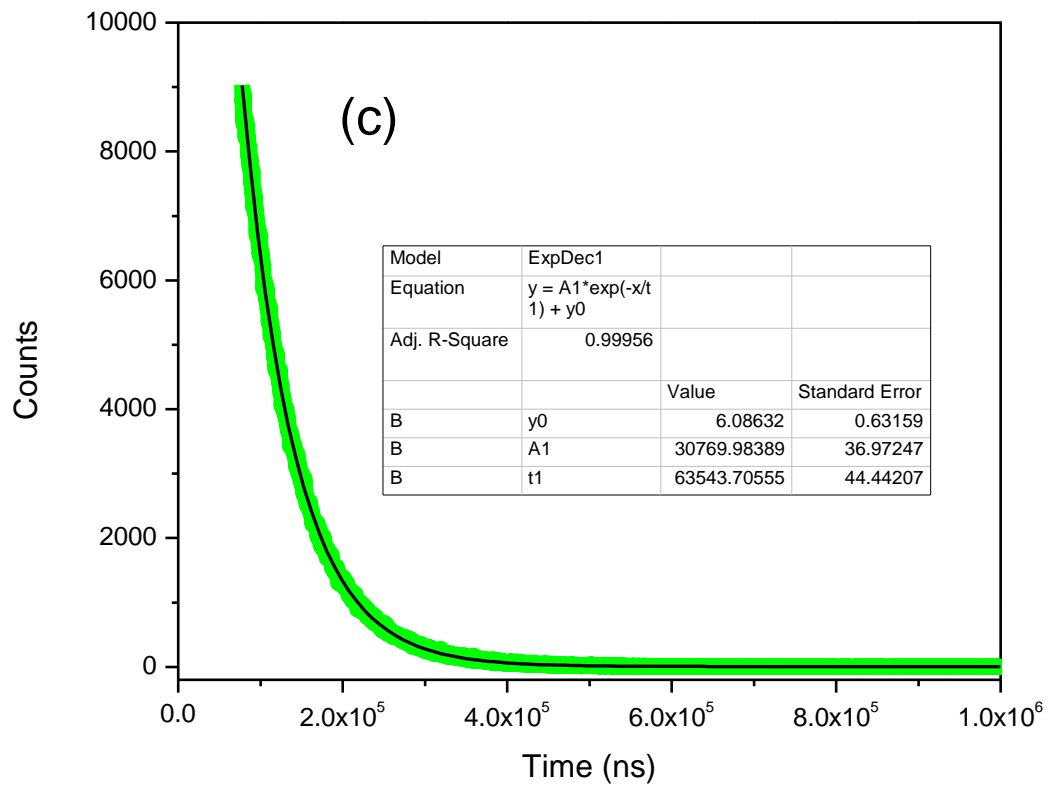
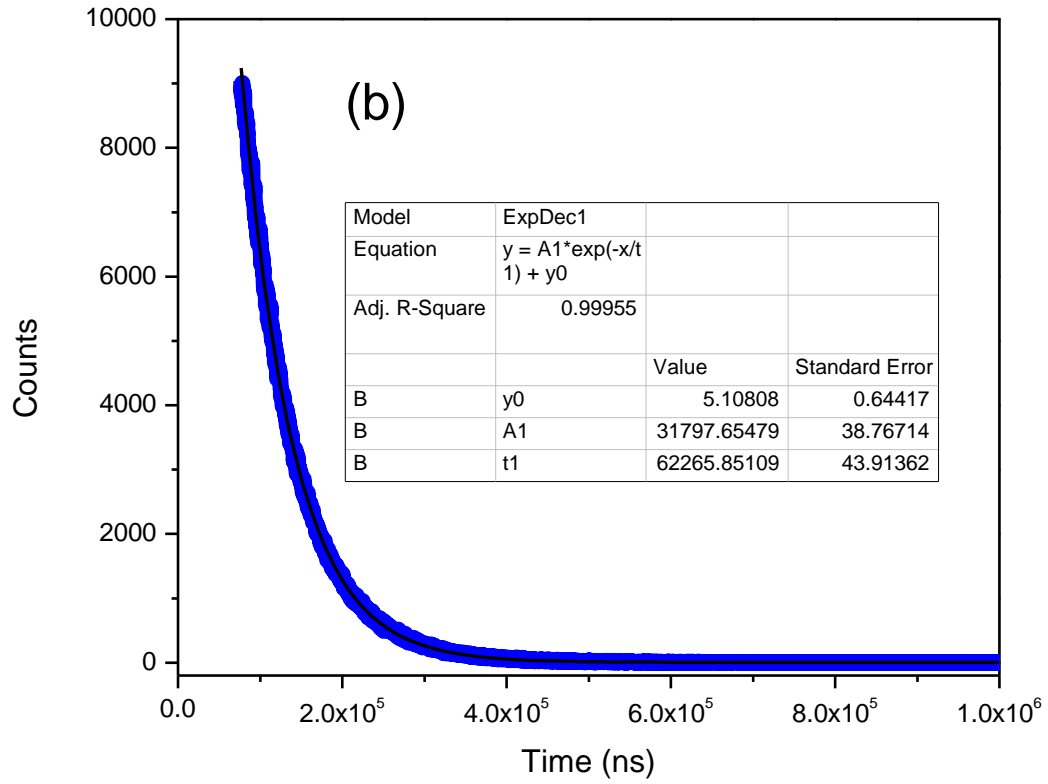


Figure S5. (a) is the decay profile of solid $[\text{Sm}(\text{dbm})_3(\text{H}_2\text{O})]$ (b) is the decay profile of its hybrid film w/w 6% and (c) is the decay profile of hybrid film w/w 6% of $[\text{Tb}(\text{dbm})_3(\text{H}_2\text{O})]$.





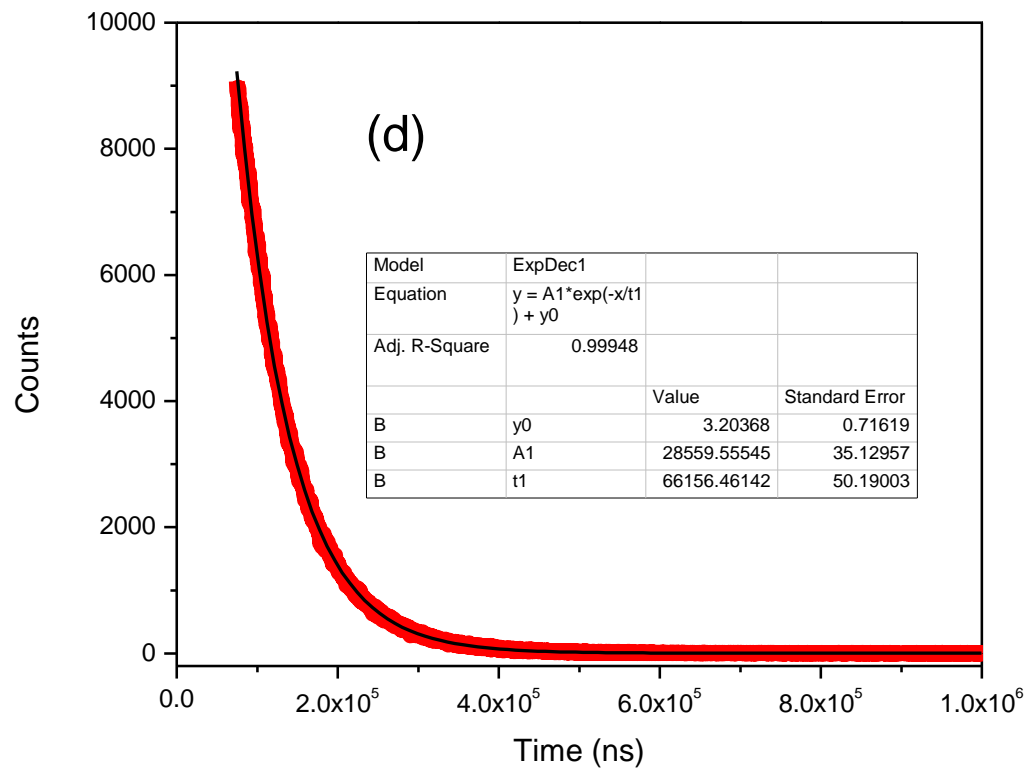
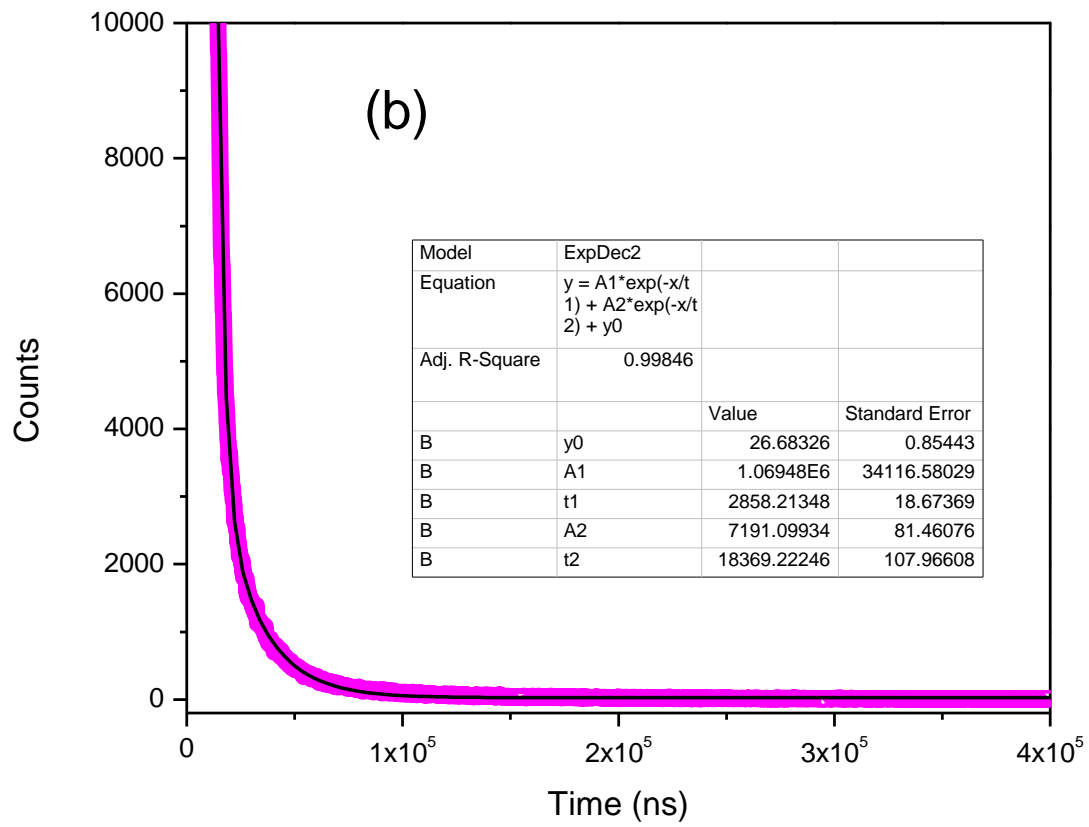
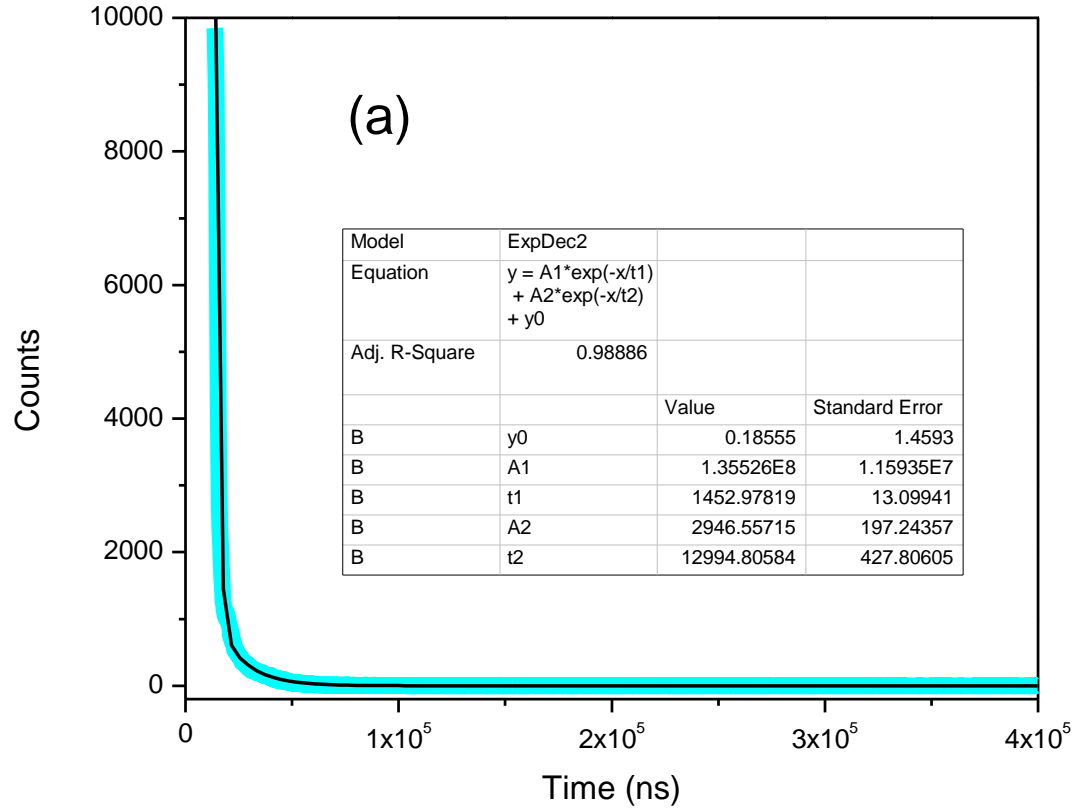


Figure S6. (a) is the decay profile of solid $[\text{Sm}(\text{dbm})_3(\text{impy})]$ and (b), (c) and (d) are the decay profile of its hybrid films w/w 6%, 3% and 1.5% respectively.



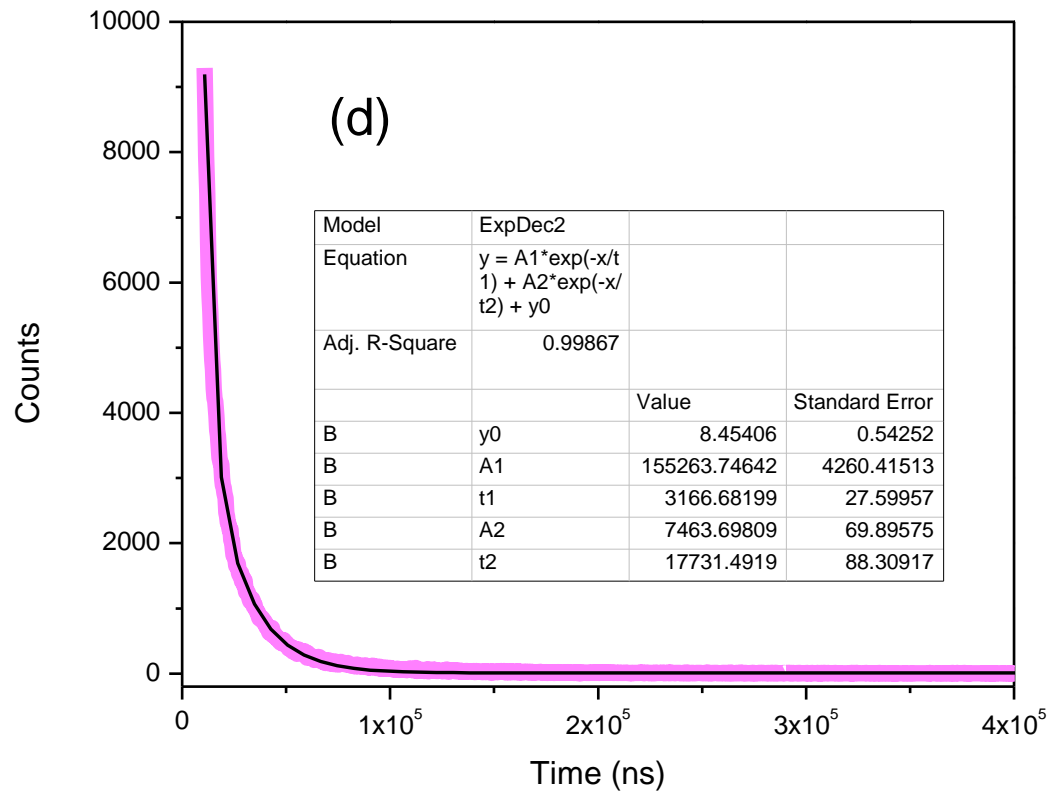
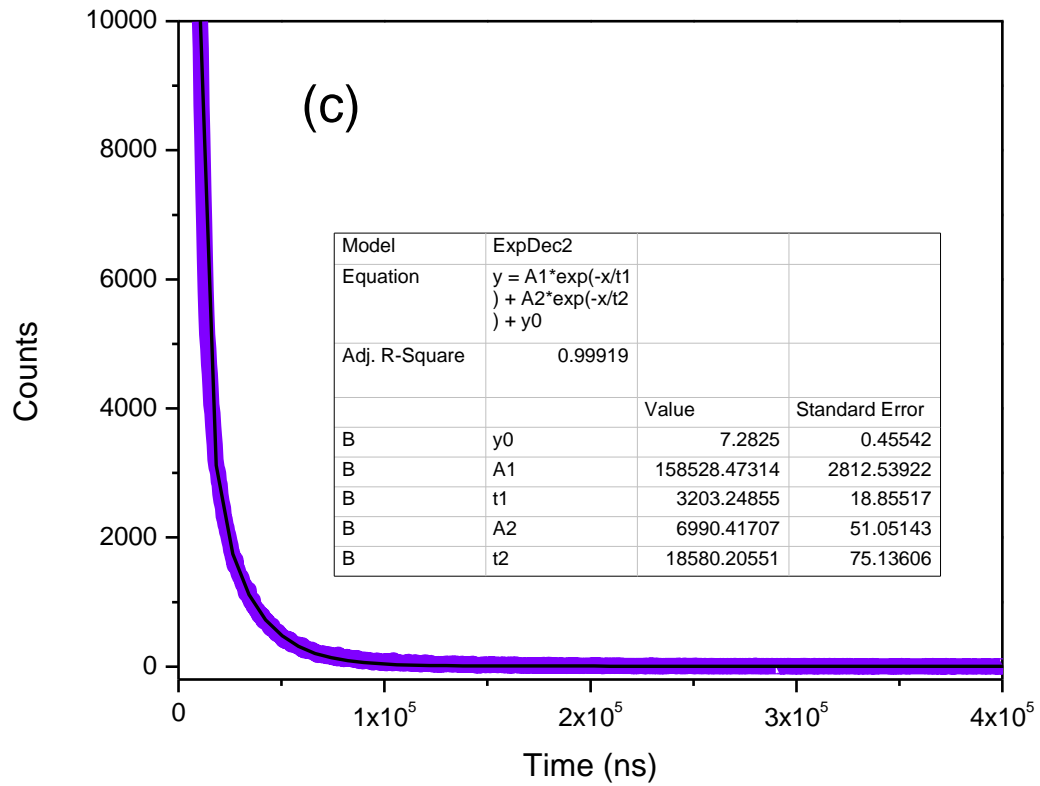


Figure S7. (a) is the decay profile of solid $[Tb(dbm)_3(imp)]$ and (b), (c) and (d) are the decay profile of its hybrid films w/w 6%, 3% and 1.5% respectively.