

Supporting Information

Two-photon sensitized visible and near-IR luminescence of lanthanide complexes using a fluorene based donor- π -acceptor diketonate

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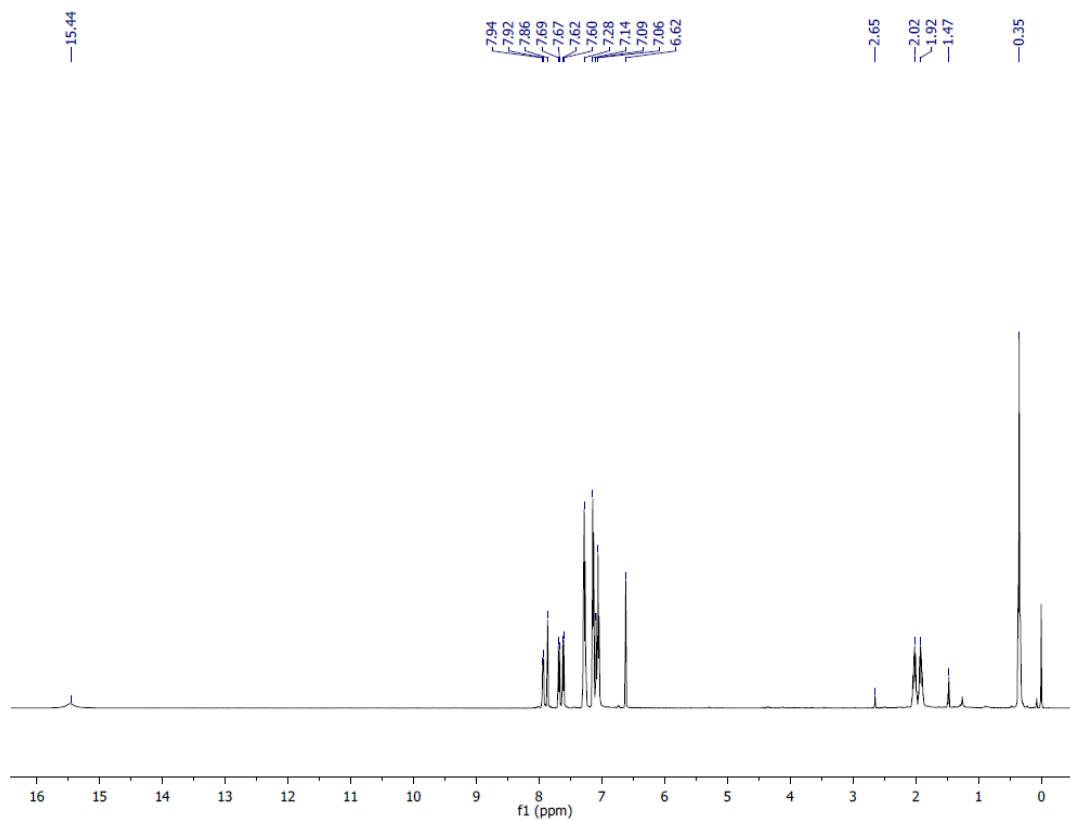


Figure S1. ^1H NMR of **1**.

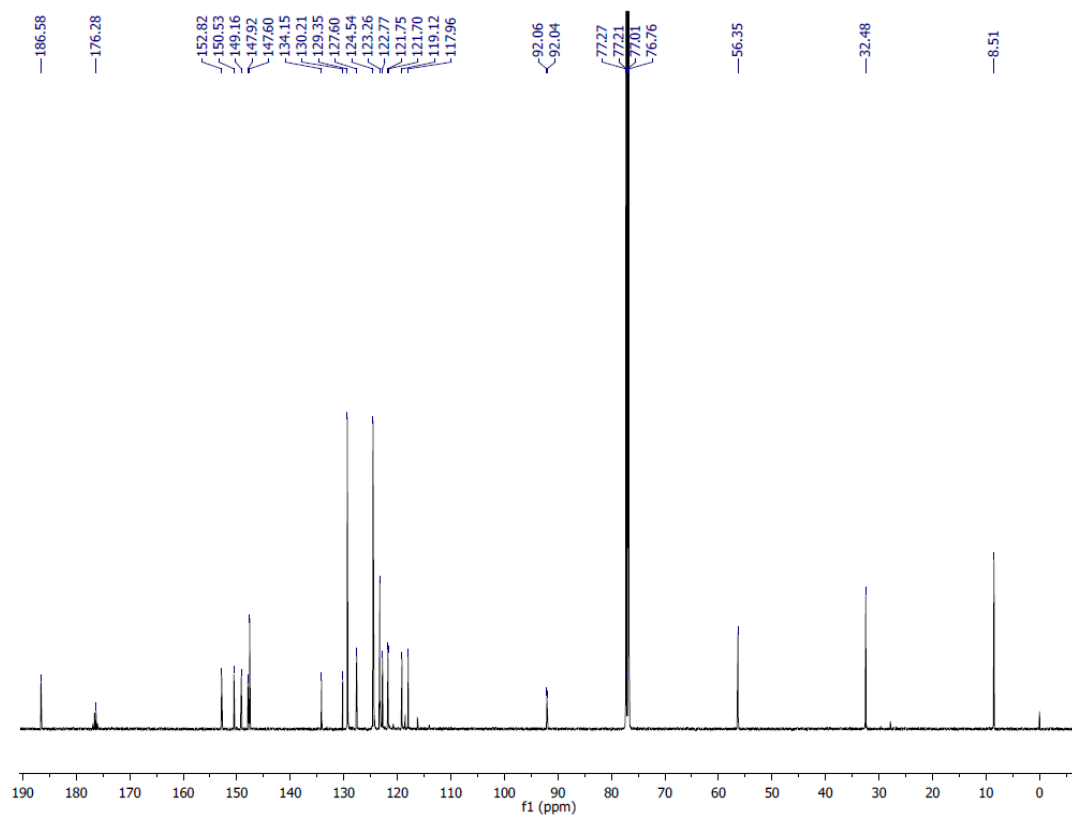


Figure S2. ^{13}C NMR of **1**.

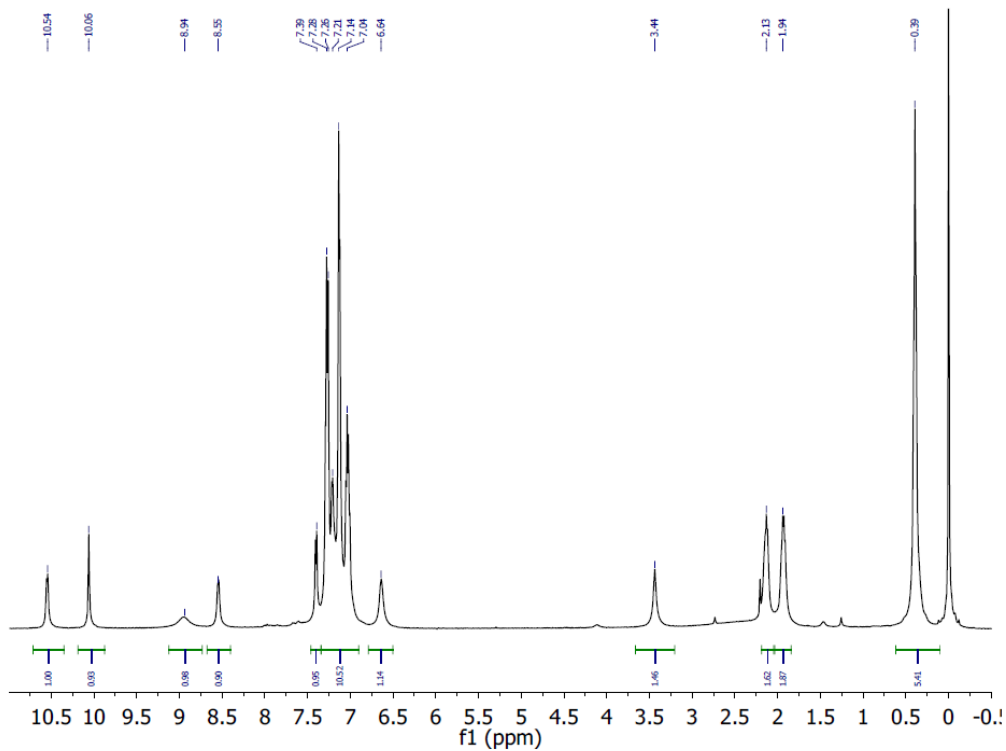


Figure S3. ^1H NMR of 2-Eu.

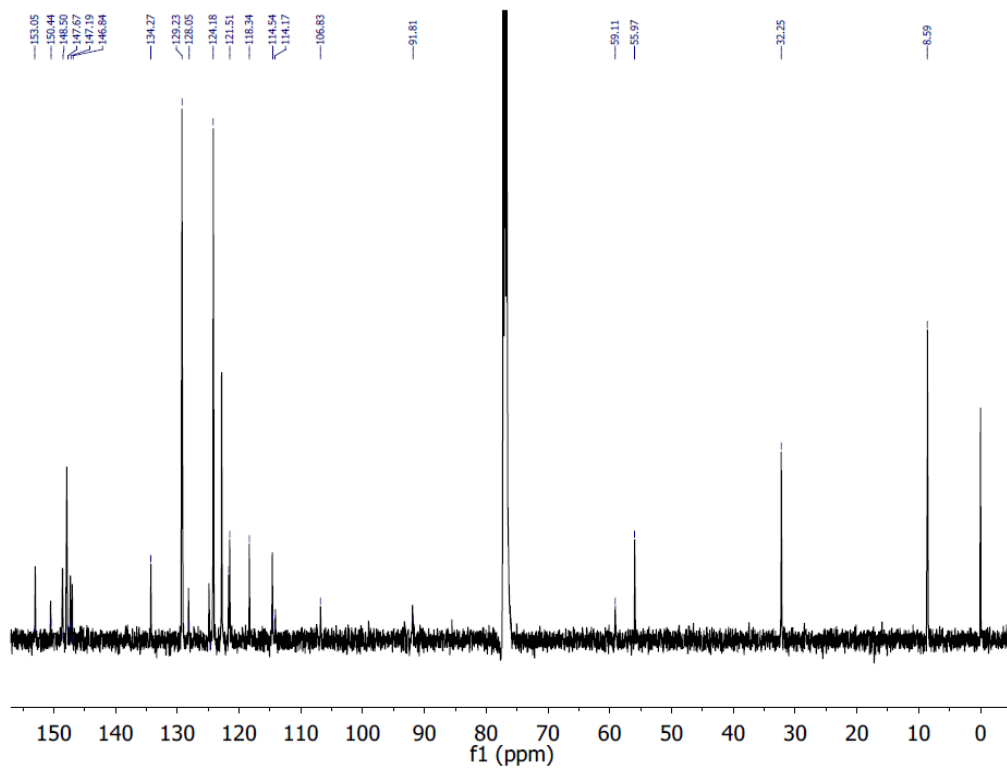


Figure S4. ^{13}C NMR of 2-Eu.

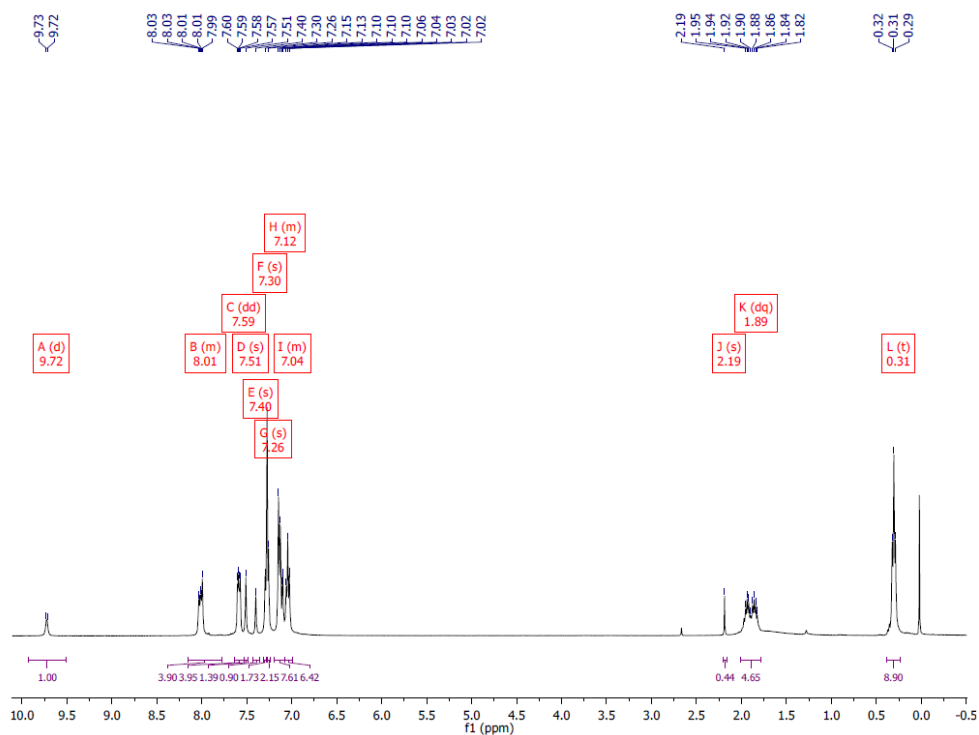


Figure S5. ^1H NMR of 2-Sm.

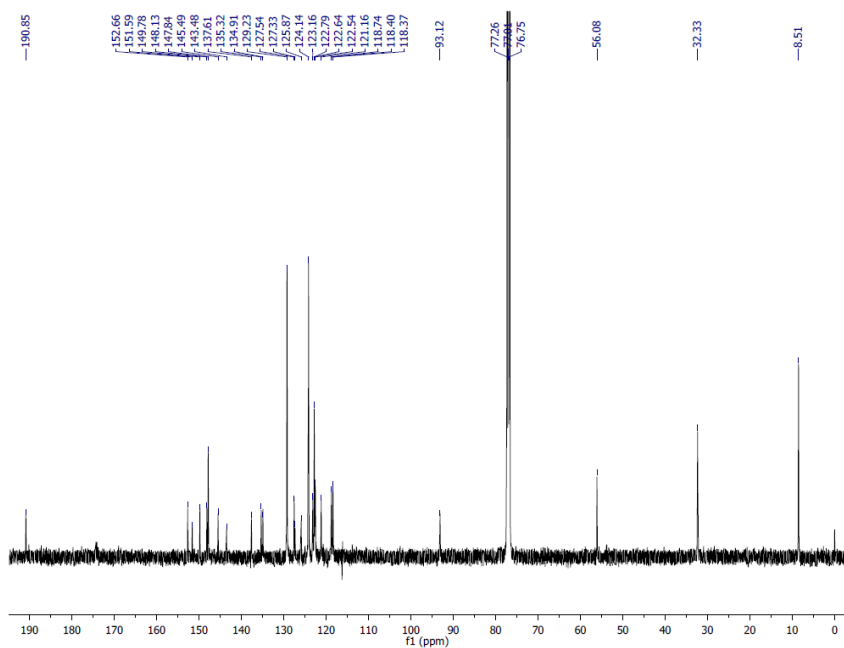


Figure S6. ^{13}C NMR of 2-Sm.

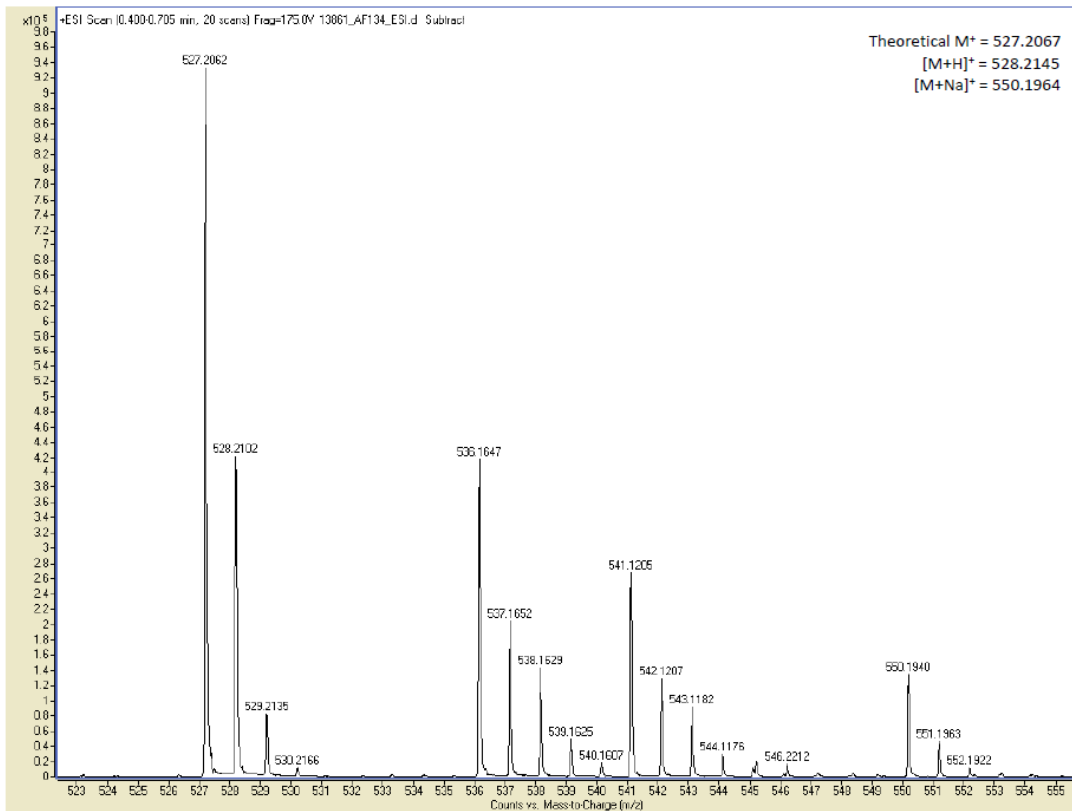


Figure S7. HRMS of 1.

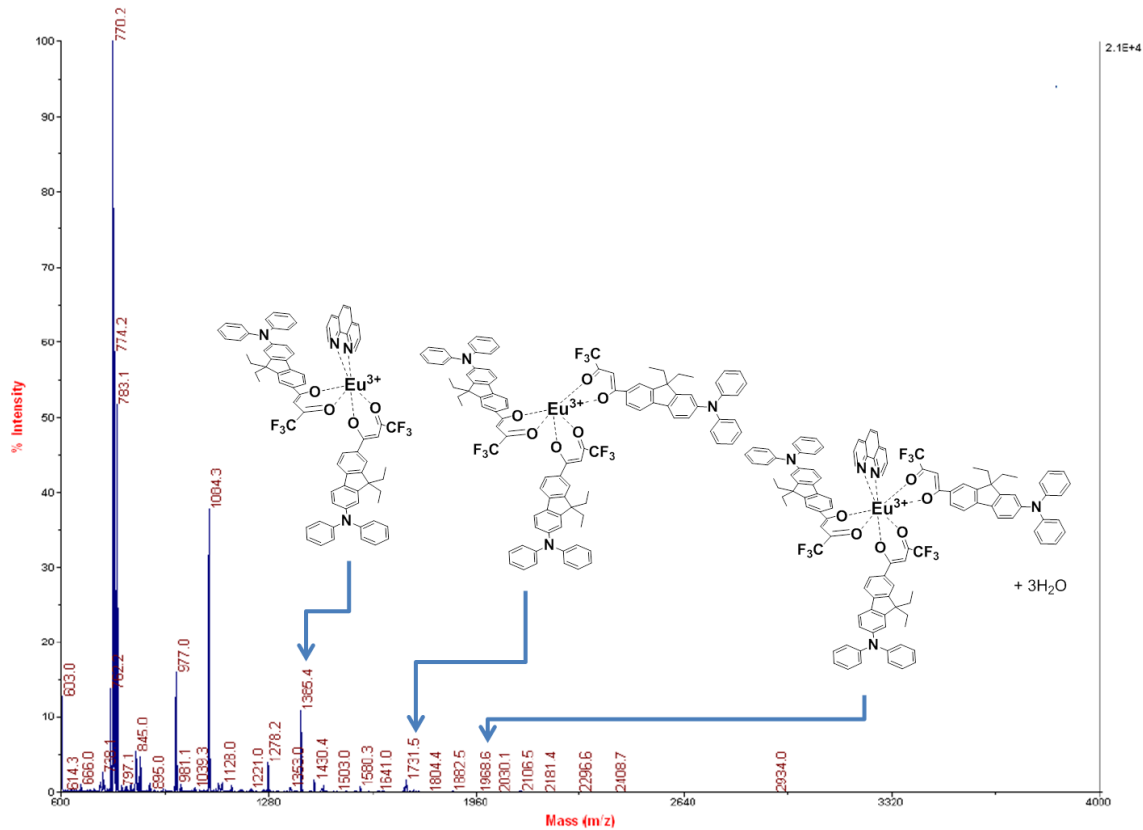


Figure S8. HRMS of 2-Eu.

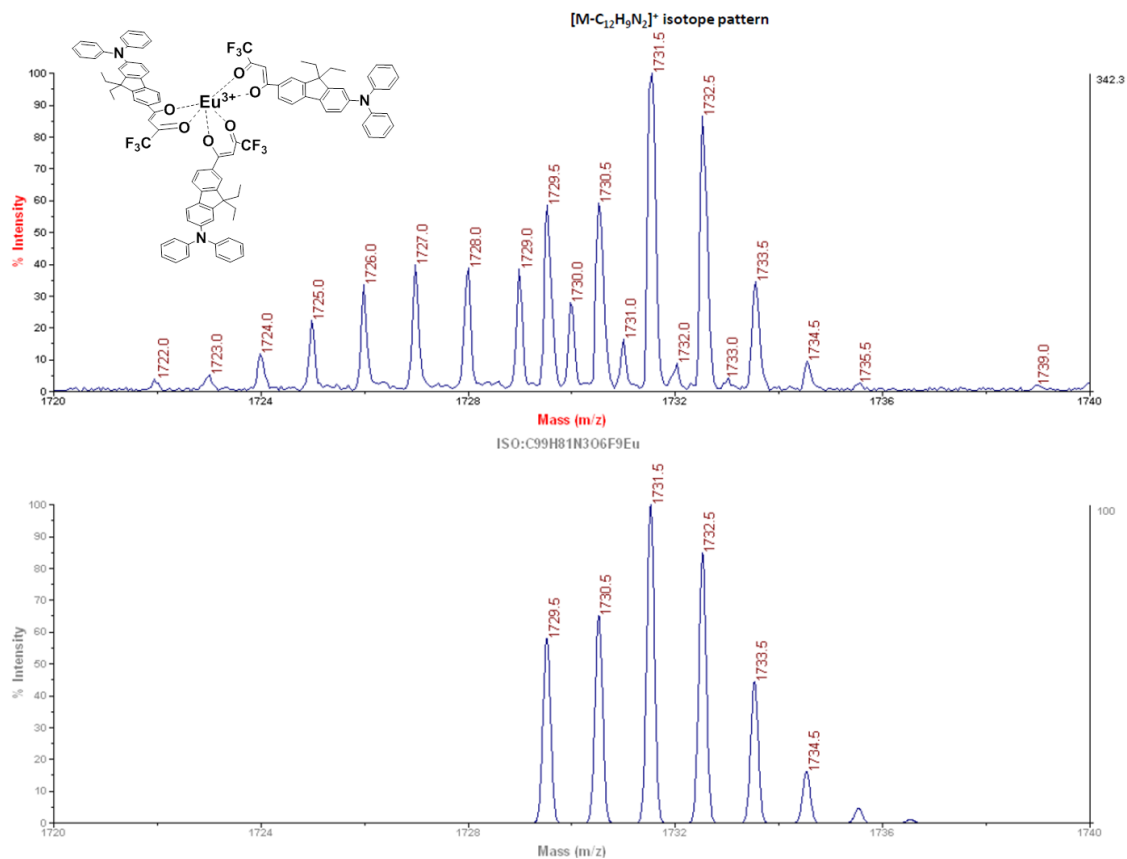


Figure S9. Actual (top) and theoretical (bottom) isotopic distributions for the $m/z = 1731.5$ fragment of **2-Eu**.

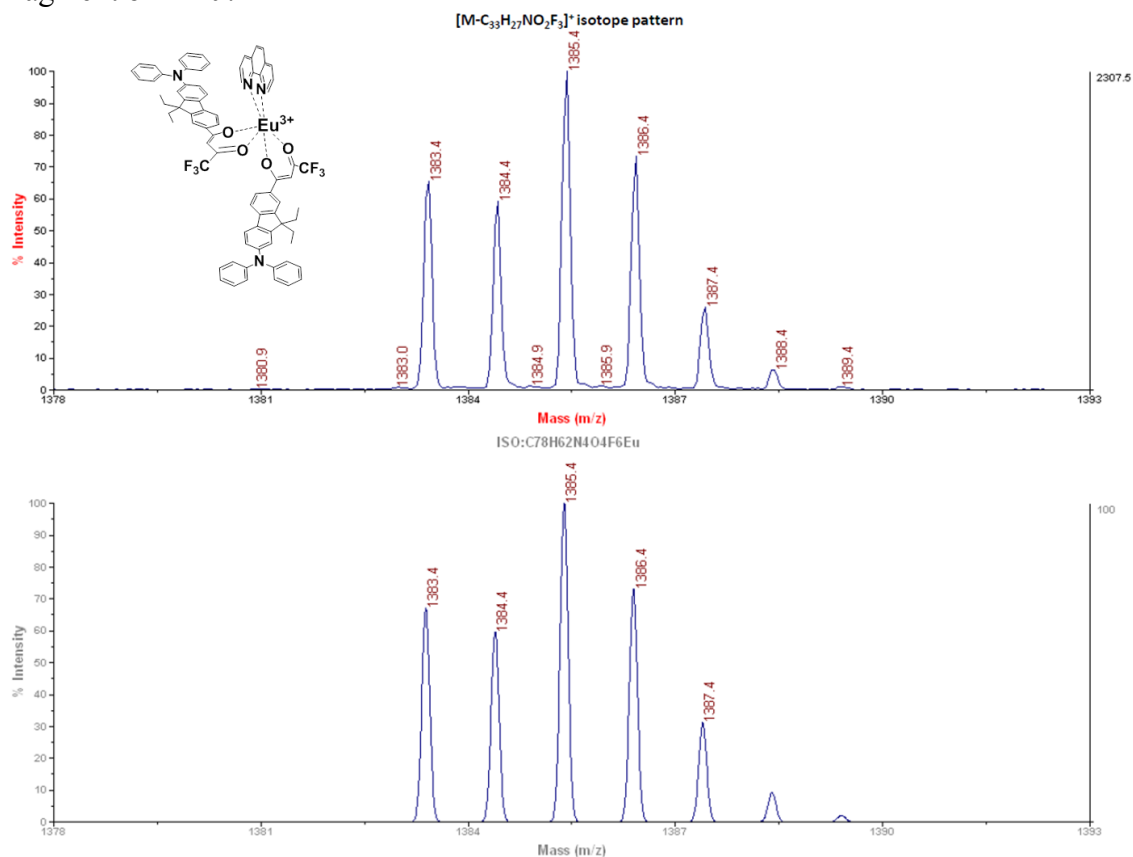


Figure S10. Actual (top) and theoretical (bottom) isotopic distributions for the $m/z = 1385.4$ fragment of **2-Eu**.

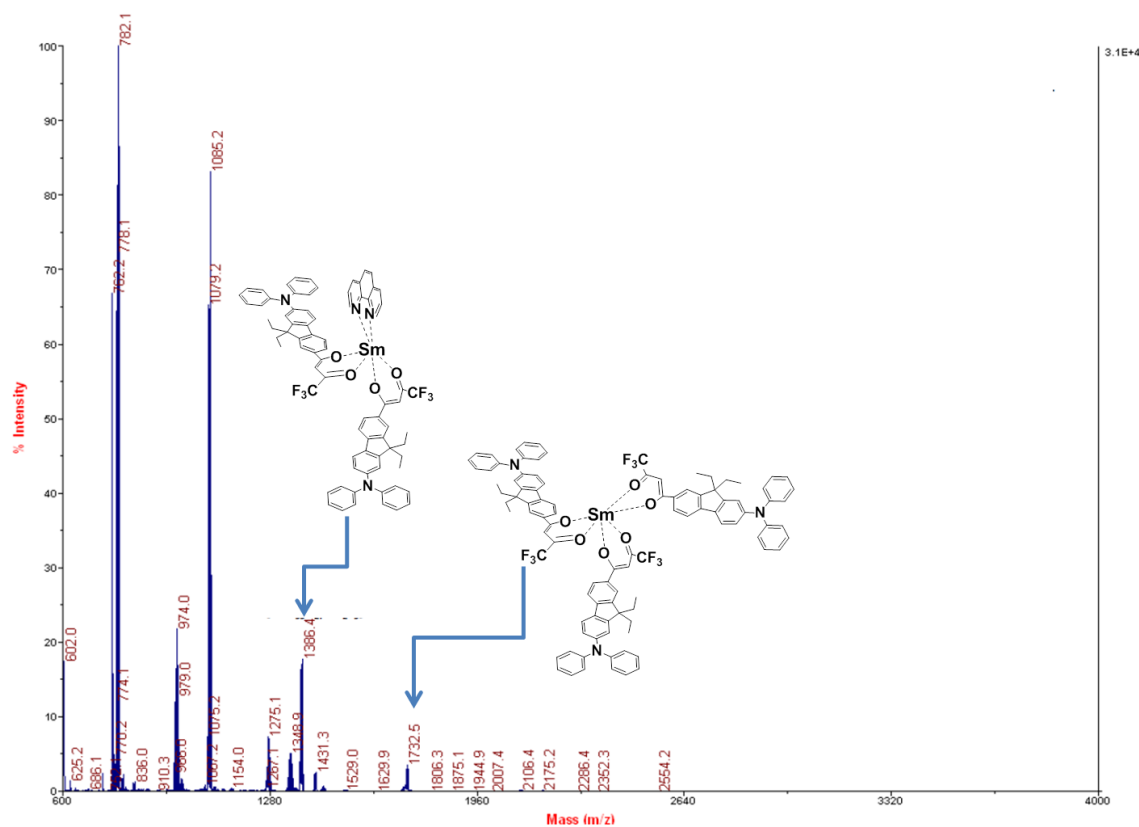


Figure S11. HRMS of 2-Sm.

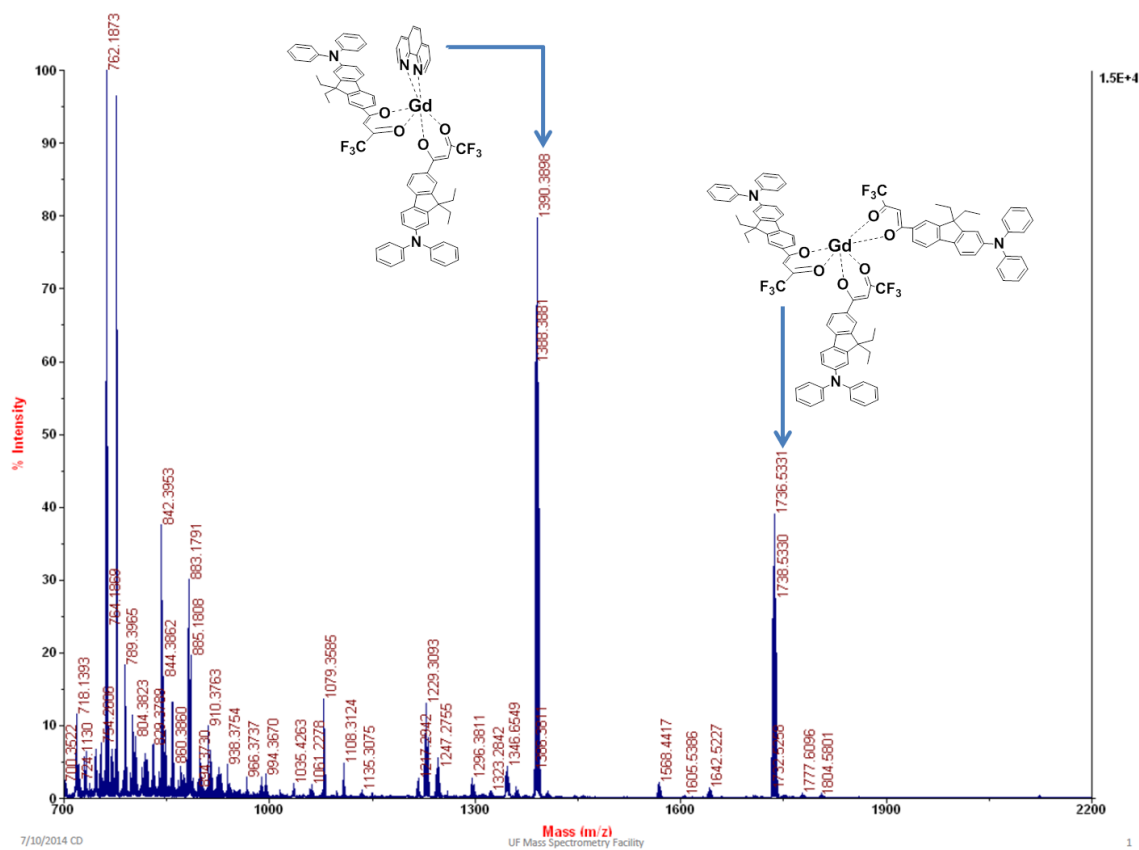


Figure S12. HRMS of 2-Gd.

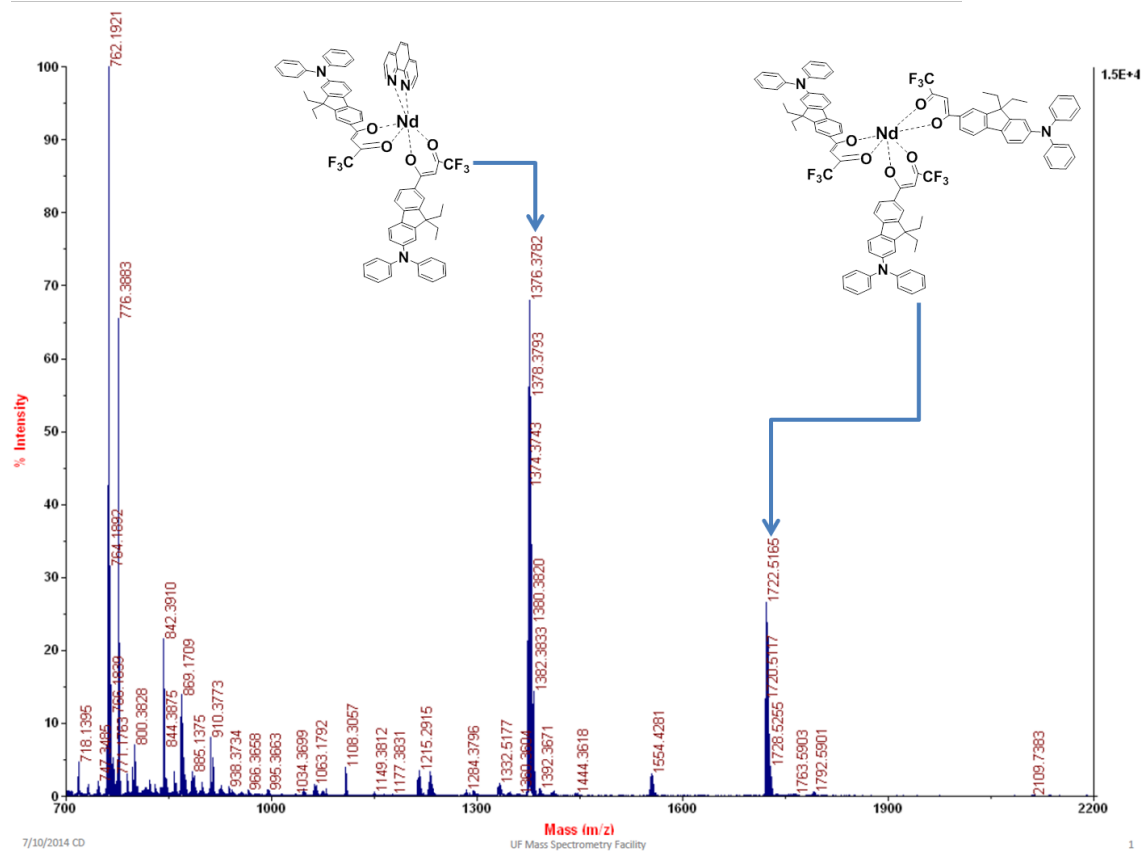


Figure S13. HRMS of 2-Nd.

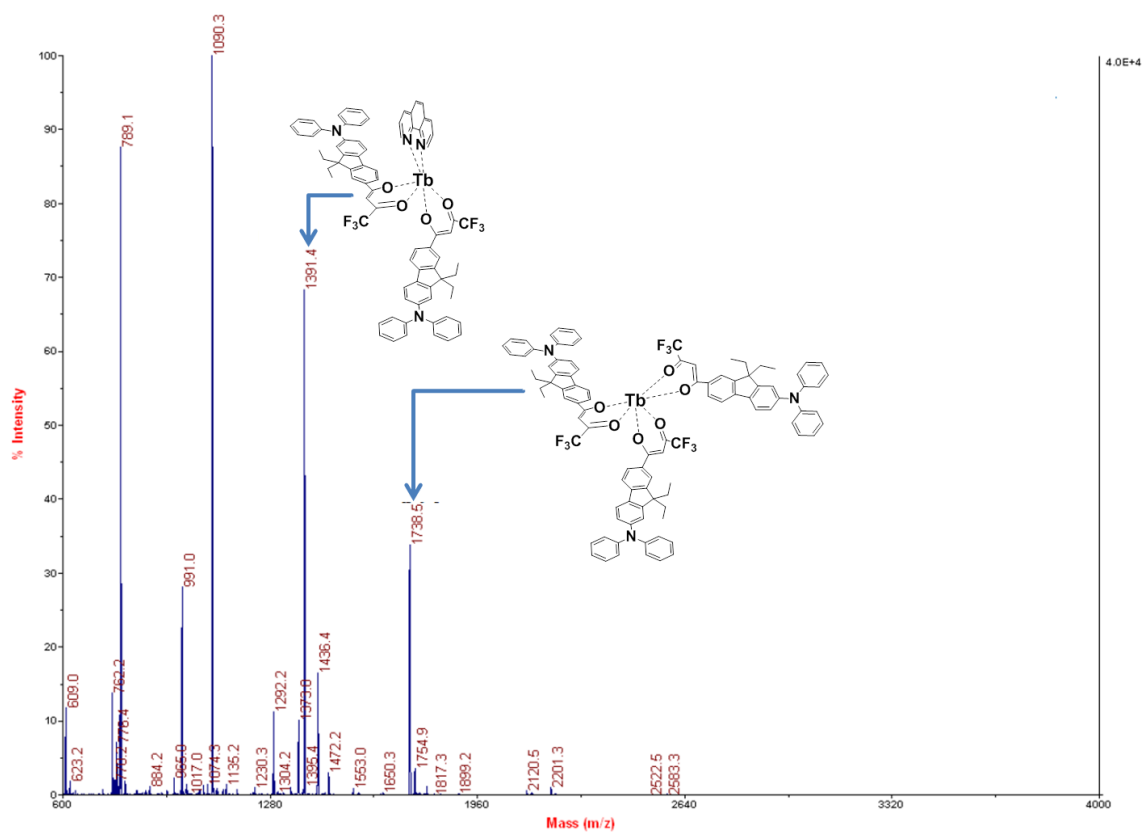


Figure S14. HRMS of 2-Tb.

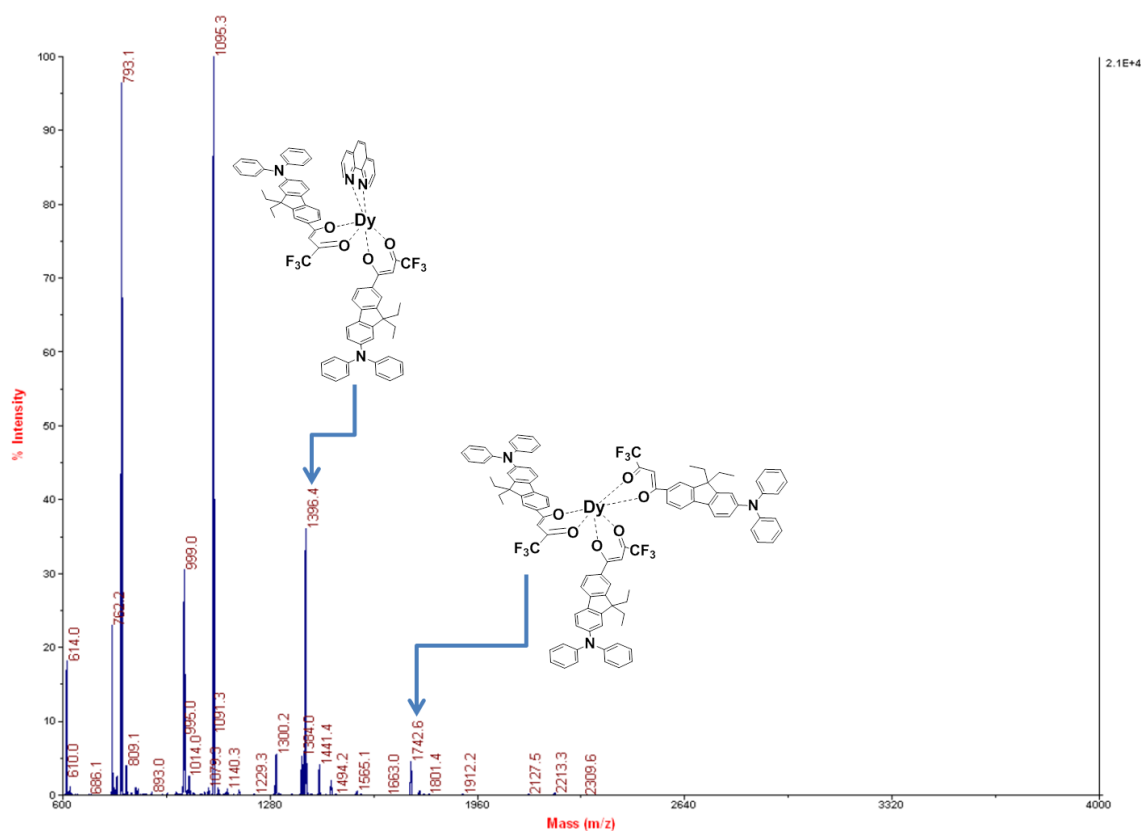


Figure S15. HRMS of 2-Dy.

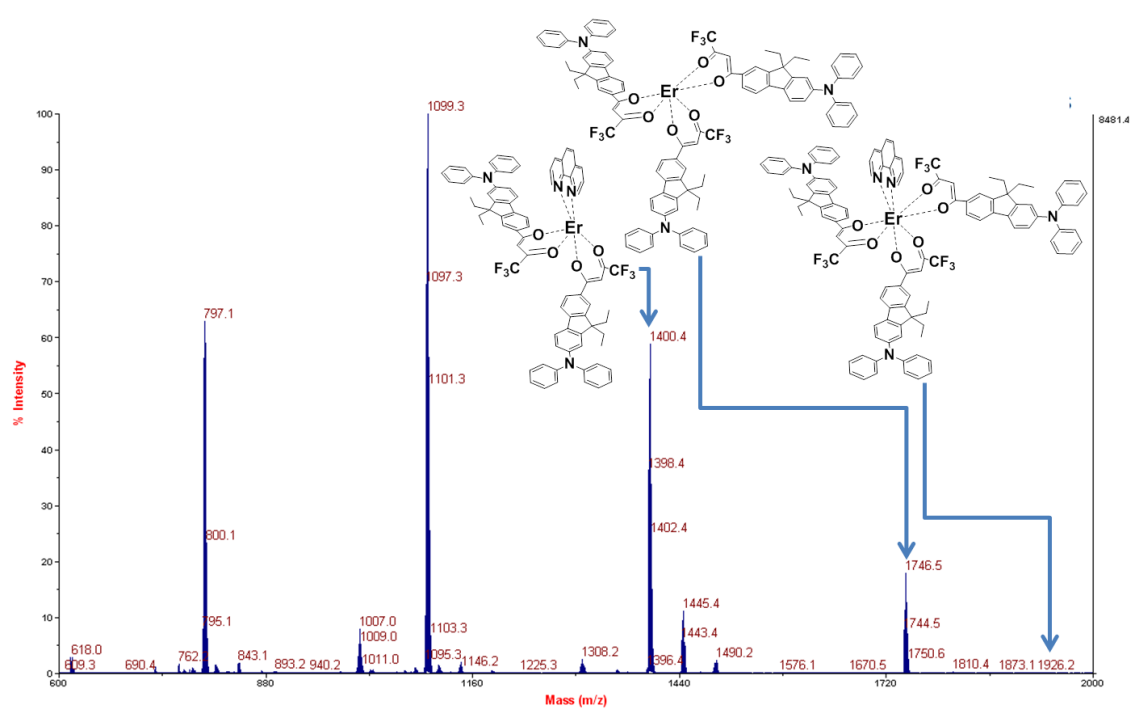


Figure S16. HRMS of 2-Er.

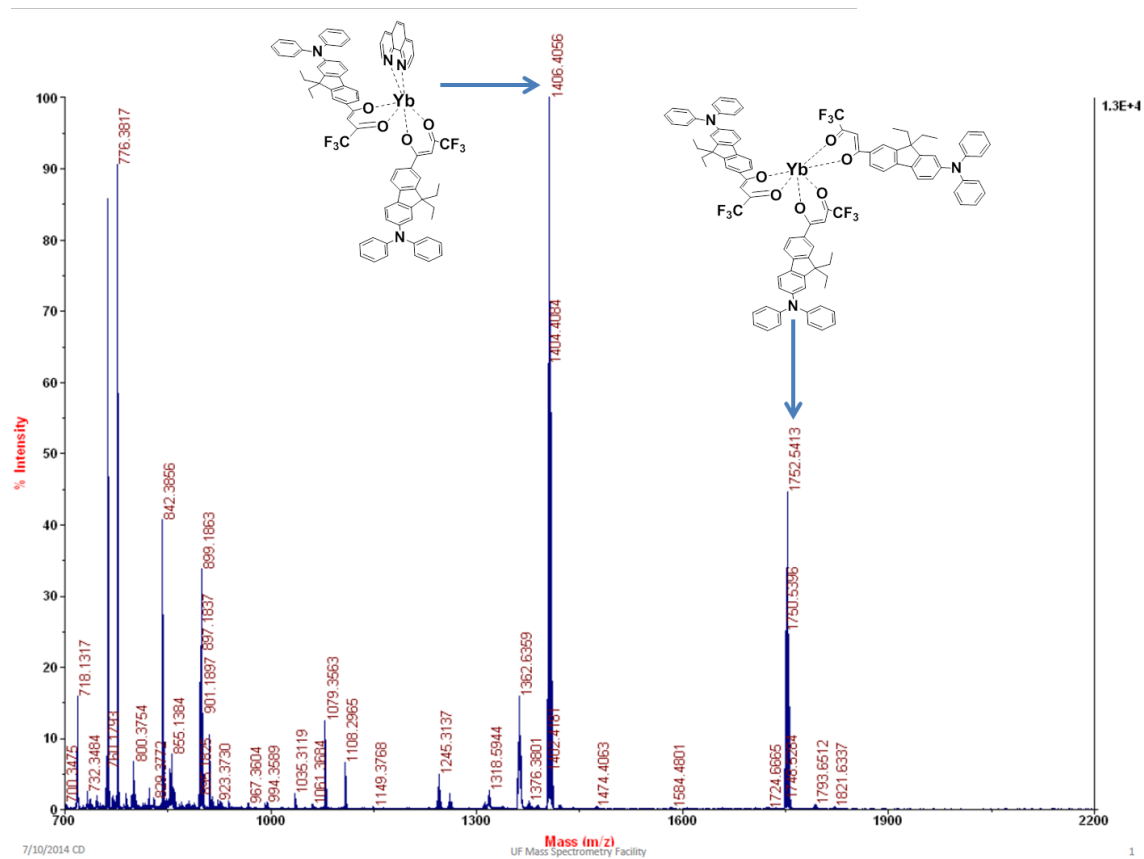


Figure S17. HRMS of 2-Yb.

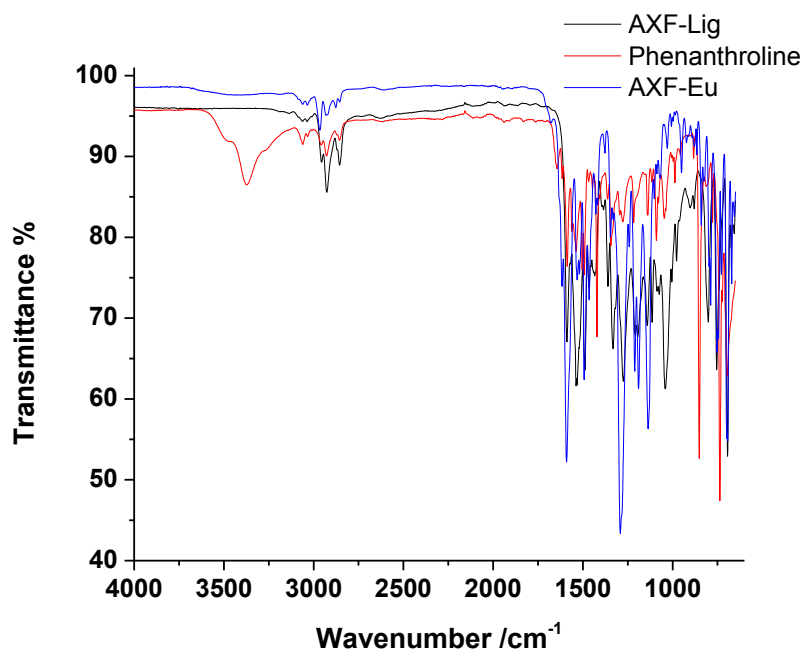


Figure S18. IR spectra of phenanthroline, 1, and 2-Eu.

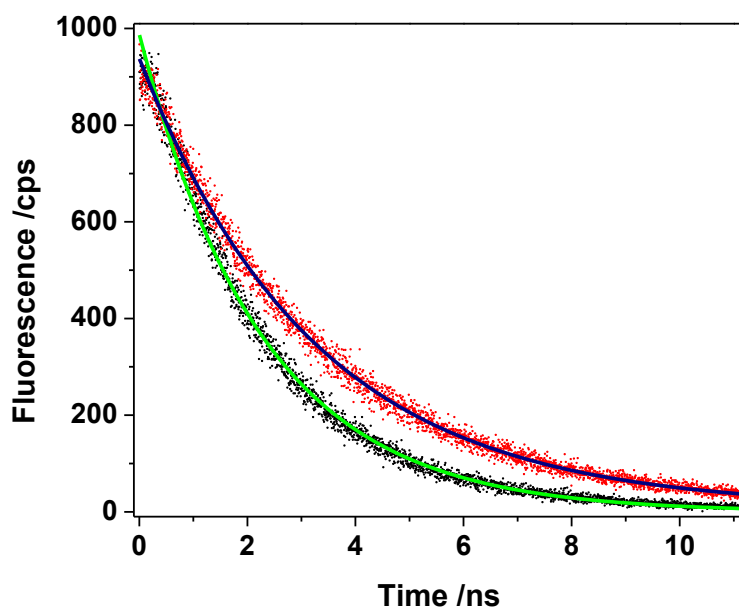


Figure S19. Fluorescence decay curves for the ligand **1** in cyclohexane and THF (black points and red points, respectively), and their respective fitted exponential functions.

Table S8. Bond Lengths for Ligand 1.

Atom	Atom	Length/Å	Atom	Atom	Length/Å
F1	C33	1.354(17)	C8	C9	1.388(8)
F2	C33	1.27(2)	C8	C13	1.398(8)
F3	C33	1.347(17)	C9	C10	1.370(8)
F1'	C33	1.26(2)	C10	C11	1.414(8)
F2'	C33	1.20(2)	C11	C12	1.382(8)
F3'	C33	1.54(2)	C12	C13	1.395(8)
O1	C32	1.254(11)	C14	C15	1.523(12)
O2	C30	1.314(10)	C16	C17	1.523(10)
N1	C11	1.404(8)	C18	C19	1.377(9)
N1	C18	1.428(8)	C18	C23	1.386(9)
N1	C24	1.433(8)	C19	C20	1.372(10)
C1	C2	1.523(9)	C20	C21	1.365(11)
C1	C13	1.512(9)	C21	C22	1.359(11)
C1	C14	1.546(11)	C22	C23	1.394(10)
C1	C16	1.558(10)	C24	C25	1.366(9)
C2	C3	1.388(9)	C24	C29	1.384(9)
C2	C7	1.391(8)	C25	C26	1.372(10)
C3	C4	1.404(9)	C26	C27	1.353(12)
C4	C5	1.406(9)	C27	C28	1.354(12)
C4	C30	1.447(10)	C28	C29	1.390(11)
C5	C6	1.388(8)	C30	C31	1.375(10)

C6	C7	1.394(8)	C31	C32	1.356(11)
C7	C8	1.459(8)	C32	C33	1.528(16)

Table S9. Bond Angles for Ligand 1.

Atom	Atom	Atom	Angle/°	Atom	Atom	Atom	Angle/°
C11	N1	C18	118.9(5)	C22	C21	C20	120.5(8)
C11	N1	C24	120.6(6)	C21	C22	C23	120.6(8)
C18	N1	C24	119.6(6)	C18	C23	C22	119.2(8)
C2	C1	C14	111.9(6)	C25	C24	N1	121.8(7)
C2	C1	C16	110.8(6)	C25	C24	C29	119.4(7)
C13	C1	C2	100.6(5)	C29	C24	N1	118.8(7)
C13	C1	C14	112.5(6)	C24	C25	C26	119.5(8)
C13	C1	C16	110.7(6)	C27	C26	C25	122.0(9)
C14	C1	C16	110.0(7)	C26	C27	C28	119.0(9)
C3	C2	C1	127.3(6)	C27	C28	C29	120.8(9)
C3	C2	C7	121.4(6)	C24	C29	C28	119.3(8)
C7	C2	C1	111.3(6)	O2	C30	C4	114.6(8)
C2	C3	C4	119.0(7)	O2	C30	C31	117.1(7)
C3	C4	C5	119.5(6)	C31	C30	C4	128.2(9)
C3	C4	C30	120.2(8)	C32	C31	C30	123.6(9)
C5	C4	C30	120.3(7)	O1	C32	C31	123.9(9)
C6	C5	C4	120.7(6)	O1	C32	C33	119.0(10)
C5	C6	C7	119.5(6)	C31	C32	C33	116.7(11)
C2	C7	C6	119.8(6)	F1	C33	F3'	53.3(10)
C2	C7	C8	108.4(6)	F1	C33	C32	109.6(16)
C6	C7	C8	131.8(6)	F2	C33	F1	107.5(13)
C9	C8	C7	133.3(6)	F2	C33	F3	117(2)
C9	C8	C13	118.5(6)	F2	C33	F3'	143.4(13)
C13	C8	C7	108.2(5)	F2	C33	C32	116.9(11)
C10	C9	C8	120.8(6)	F3	C33	F1	99.4(12)
C9	C10	C11	120.6(6)	F3	C33	F3'	50.8(9)
N1	C11	C10	121.2(6)	F3	C33	C32	105.4(12)
C12	C11	N1	119.7(6)	F1'	C33	F1	36.7(9)
C12	C11	C10	119.0(6)	F1'	C33	F2	74.6(13)
C11	C12	C13	119.6(6)	F1'	C33	F3	129.5(12)
C8	C13	C1	111.4(5)	F1'	C33	F3'	89.7(14)
C12	C13	C1	127.4(6)	F1'	C33	C32	112.0(14)
C12	C13	C8	121.2(6)	F2'	C33	F1	128.4(14)
C15	C14	C1	114.2(7)	F2'	C33	F2	73.3(19)
C17	C16	C1	115.2(6)	F2'	C33	F3	45.7(9)
C19	C18	N1	120.7(7)	F2'	C33	F1'	131(2)
C19	C18	C23	119.0(7)	F2'	C33	F3'	94.6(13)
C23	C18	N1	120.3(7)	F2'	C33	C32	115.3(11)

C20	C19	C18	121.3(8)	C32	C33	F3'	99.5(14)
C21	C20	C19	119.6(8)				