Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C


# Supporting Information
# For

## A New Tetrakis *β*-Diketone Ligand for NIR Emitting $Ln^{III}$ Ions: Luminescent Doped PMMA Films and Flexible Resins for Advanced Photonic Applications

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***6 Pages***

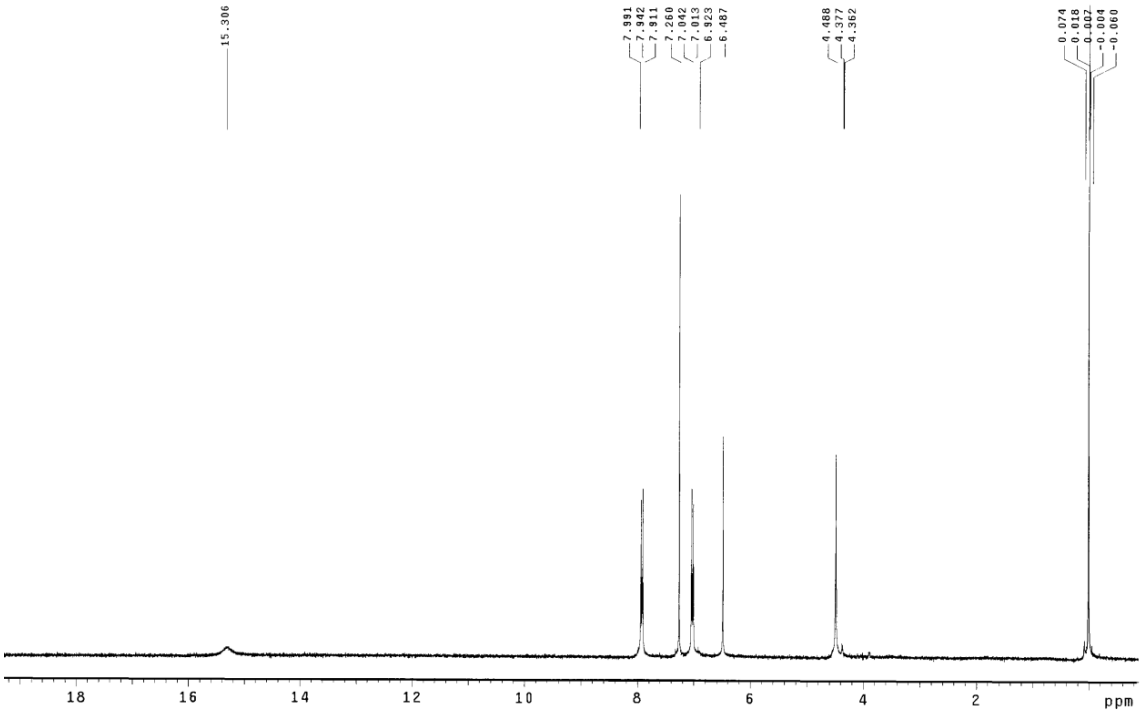


**Figure S1.** $^{1}H$ NMR spectrum of $H_4L$ in $CDCl_3$.

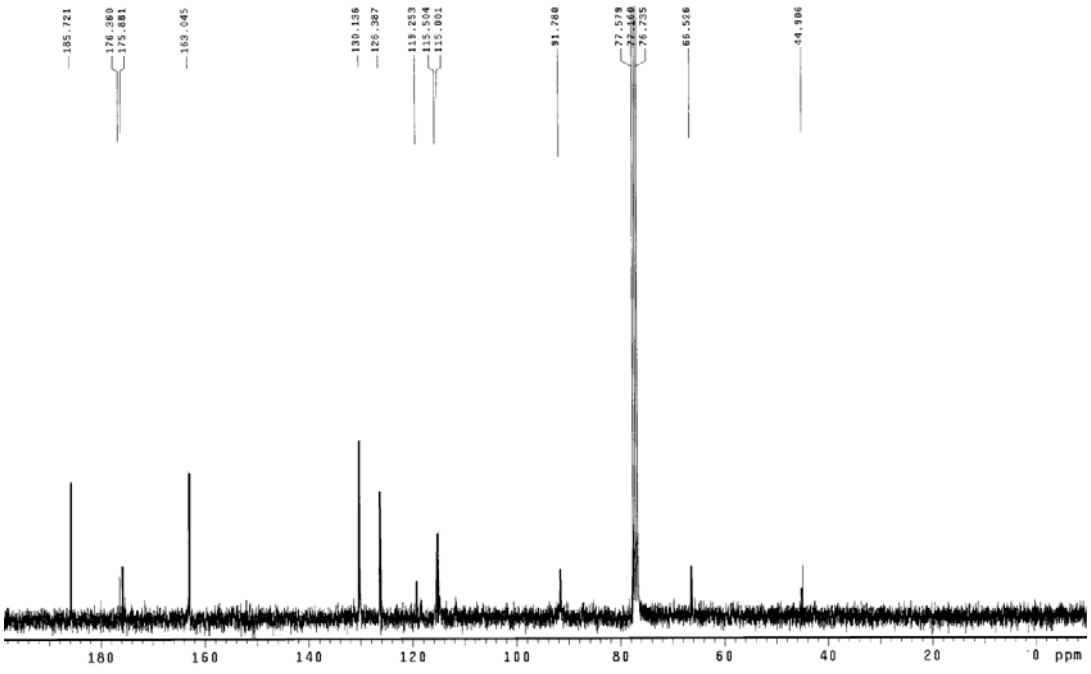


**Figure S2.** $^{13}C$ NMR spectrum of $H_4L$ in $CDCl_3$.

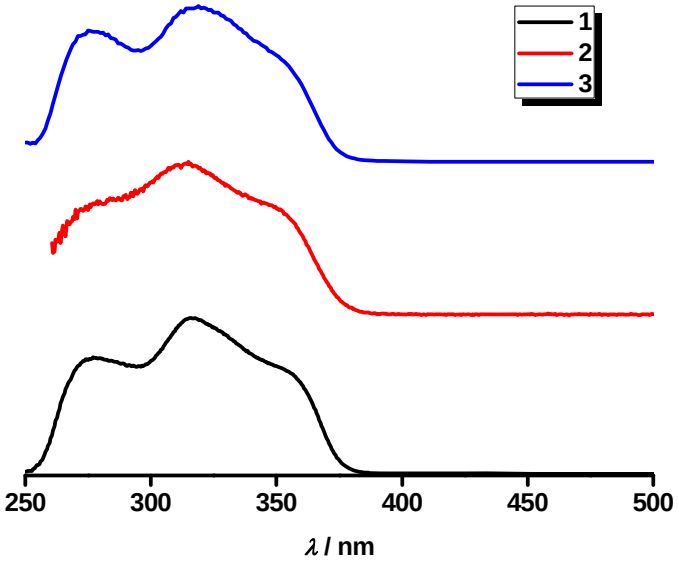


**Figure S3.** Excitation spectra of $Ln^{III}$ complexes in DMF ($c = 10^{-5}$ M) at 298 K; emission monitored at 642 nm (**1**), 1540 nm (**3**) and 984 nm (**4**); vertical scale: arbitrary units.

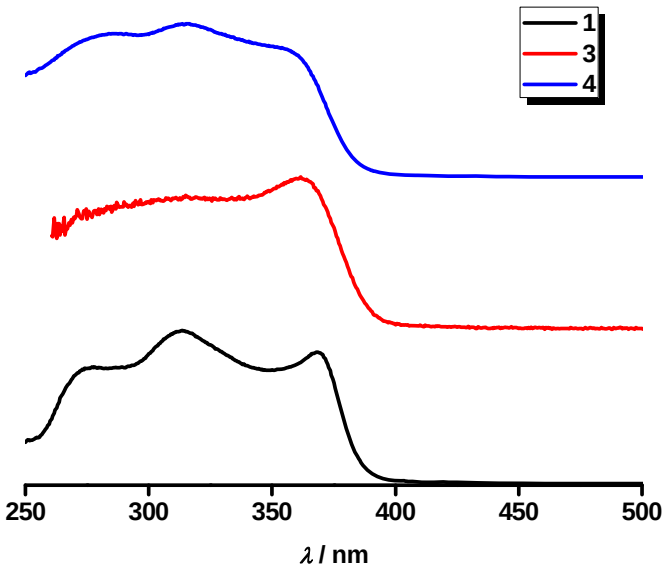


**Figure S4.** Excitation spectra of $Ln^{III}$ complexes doped PMMA films (4 wt%) at 298 K; emission monitored at 642 nm (**1**), 1540 nm (**3**) and 984 nm (**4**); vertical scale: arbitrary units.

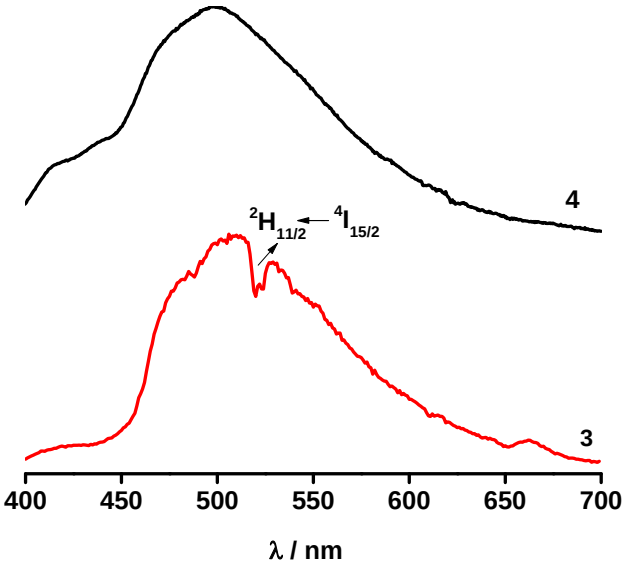


**Figure S5.** Corrected emission spectra of **3** and **4** at 298 K in solid state ($\lambda_{ex}$ = 365 nm); vertical scale: arbitrary units.

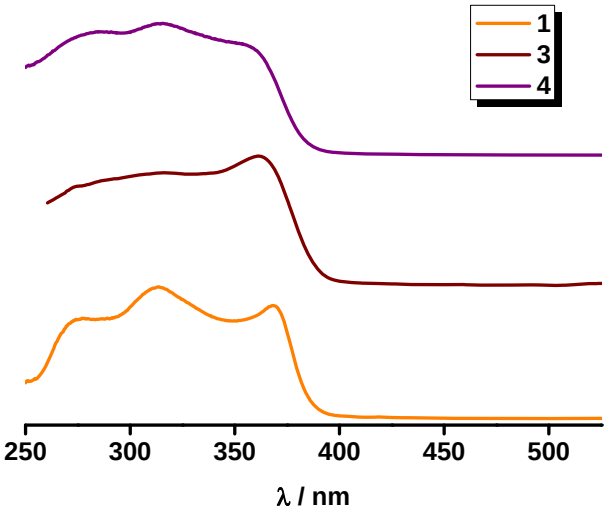


**Figure S6.** Excitation spectra of **1**, **3**, and **4** doped into PMMA fibres (4 wt%) at 298 K; vertical scale: arbitrary units.

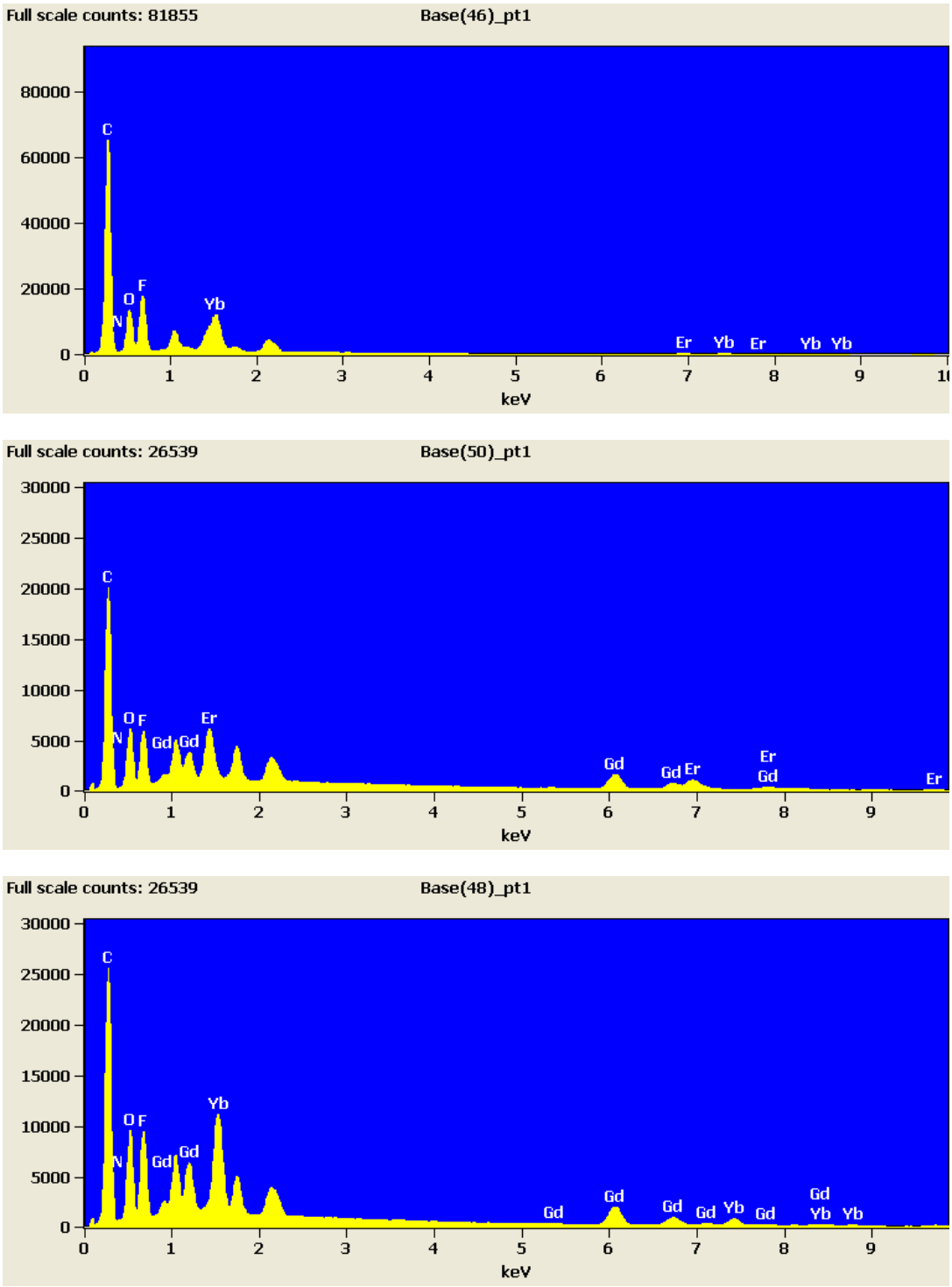


**Figure S7.** EDS spectra of heterometallic complexes **5-7**.

**Table S1.** EDS elemental analysis data for heterometallic complexes **5-7**. L and M indicate the X-ray band used.

| $Ln_{0.5}Ln'_{0.5}$ | Element | Wt (%) | At (%) | Ln/Ln' |
|---|---|---|---|---|
| $Er_{0.5}Yb_{0.5}$ | Er-M | 25.23 | 3.54 | 1.03 |
| **5** | Yb-M | 27.00 | 3.66 | |
| $Er_{0.5}Gd_{0.5}$ | Er-L | 20.59 | 3.76 | 0.97 |
| **6** | Gd-L | 20.00 | 3.88 | |
| $Gd_{0.5}Yb_{0.5}$ | Gd-L | 17.39 | 3.26 | 1.00 |
| **7** | Yb-M | 19.16 | 3.26 | |

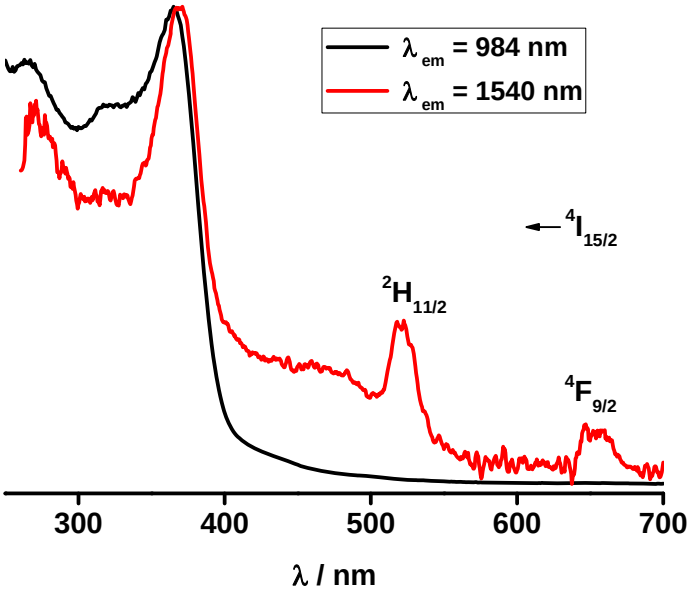


**Figure S8.** Excitation spectra of **5** at 298K in solid state; vertical scale: arbitrary units.