Supplementary Information for

Extraction and Complexation studies with 2,6-bis(5-(tert-butyl)-1*H*-pyrazol-3-yl)pyridine in the presence of 2-bromohexanoic acid.

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KEYWORDS Actinides, Lanthanides, Lipophilic ligands, Complexation, Selectivity, N-Donor ligand.

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TRLFS Cm(III)

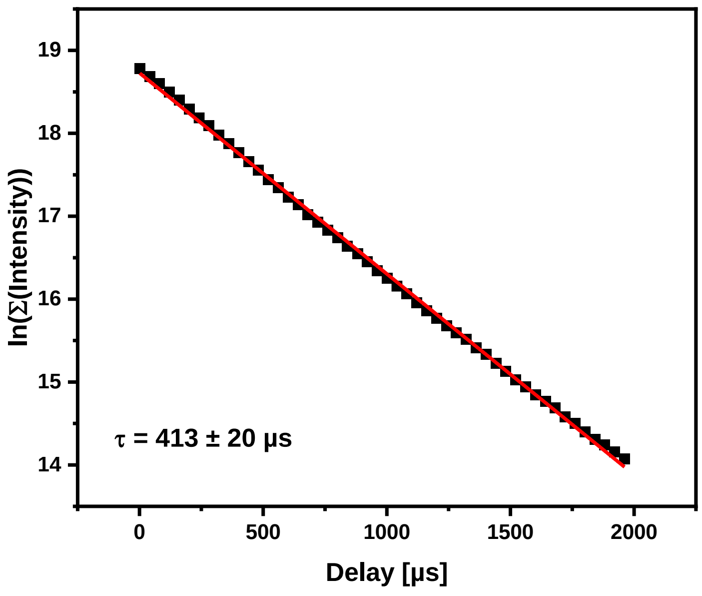

Figure S1: Fluorescence lifetime of $[Cm(C4\text{-}BPP)_3]^{3+}$ in the organic phase after extraction. Organic phase 1.0×10^{-2} mol/L C4-BPP and 5.0×10^{-1} mol/L 2-bromohexanoic acid in TPH/1-octanol (10 vol.%). Aqueous phase 3.0×10^{-1} mol/L nitric acid. A/O = 1. T = 293 K.

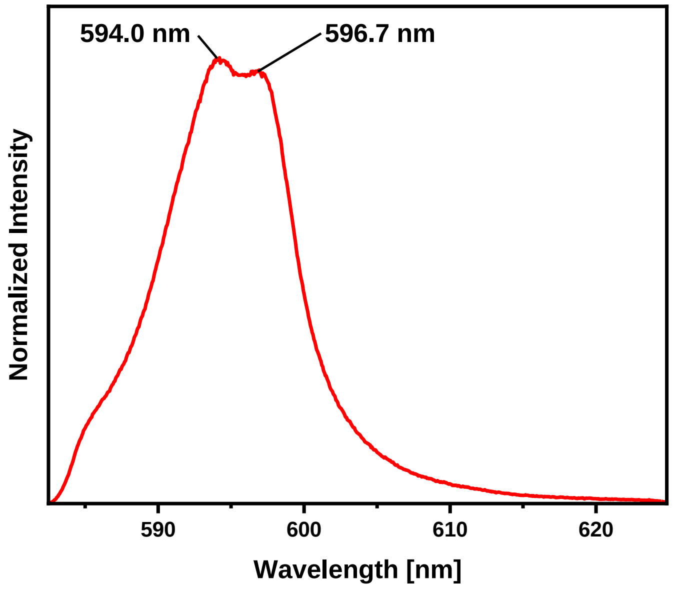

Figure S2: Normalized fluorescence spectra of Cm(III) in the aqueous phase after extraction. Organic phase 1.0×10^{-2} mol/L C4-BPP and 5.0×10^{-1} mol/L 2-bromohexanoic acid in TPH/1-octanol (10 vol.%). Aqueous phase 3.0×10^{-1} mol/L nitric acid. A/O = 1. T = 293 K.

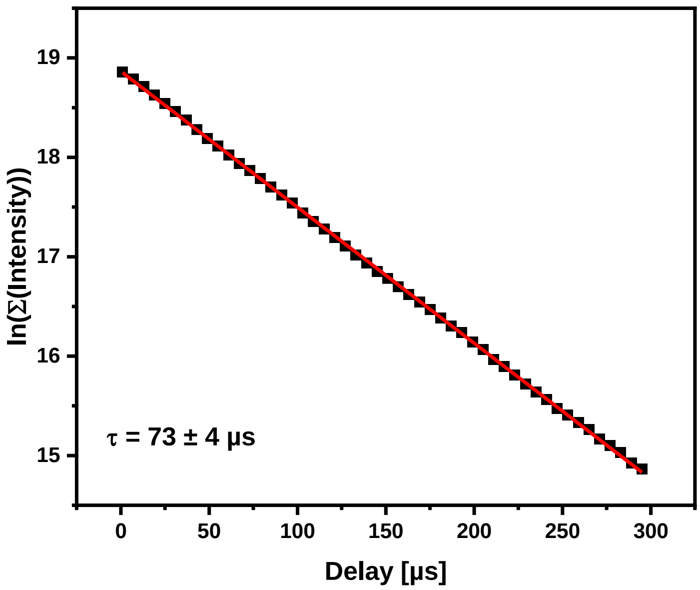

Figure S3: Fluorescence lifetime of $[Cm(solv.)]^{3+}$ in the aqueous phase after extraction. Organic phase 1.0×10^{-2} mol/L C4-BPP and 5.0×10^{-1} mol/L 2-bromohexanoic acid in TPH/1-octanol (10 vol.%). Aqueous phase 3.0×10^{-1} mol/L nitric acid. A/O = 1. T = 293 K.

TRLFS Eu(III)

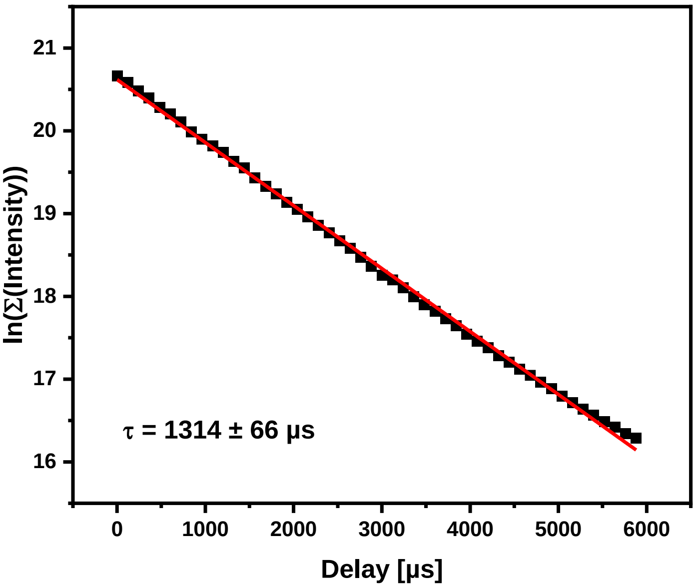

Figure S4: Fluorescence lifetime of $[Eu(C4\text{-}BPP)_2(2\text{-bromohexanoate})_m]^{(3-m)+}$ (m =1-3) in the organic phase after extraction. Organic phase 1.0×10^{-2} mol/L C4-BPP and 5.0×10^{-1} mol/L 2-bromohexanoic acid in TPH/1-octanol (10 vol.%). Aqueous phase 3.0×10^{-1} mol/L nitric acid. A/O = 1. T = 293 K.

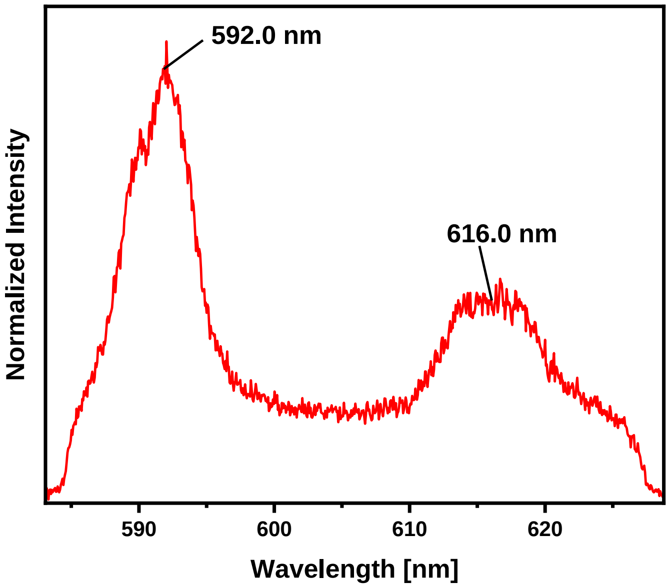

Figure S5: Normalized fluorescence spectra of the $^7F_1$ and $^7F_2$ emission bands of Eu(III) in the aqueous phase after extraction. Organic phase 1.0×10^{-2} mol/L C4-BPP and 5.0×10^{-1} mol/L 2-bromohexanoic acid in TPH/1-octanol (10 vol.%). Aqueous phase 3.0×10^{-1} mol/L nitric acid. A/O = 1. T = 293 K.

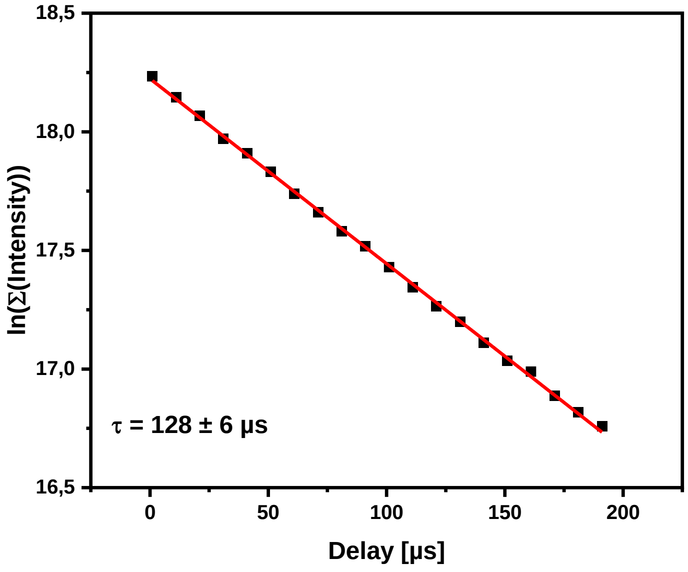

Figure S6: Fluorescence lifetime of $[Eu(solv.)]^{3+}$ in the aqueous phase after extraction. Organic phase 1.0×10^{-2} mol/L C4-BPP and 5.0×10^{-1} mol/L 2-bromohexanoic acid in TPH/1-octanol (10 vol.%). Aqueous phase 3.0×10^{-1} mol/L nitric acid. A/O = 1. T = 293 K.

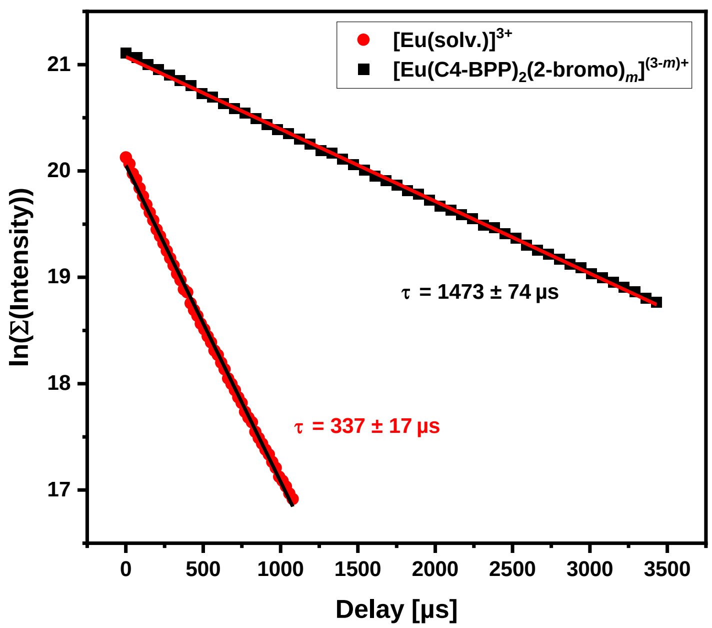

Figure S7: Fluorescence lifetime of $[Eu(C4\text{-}BPP)_n(2\text{-bromohexanoate})_m]^{(3-m)+}$ (n = 0, 2; m = 1-3) in methanol containing 1.5 vol.% water and 0.5 mol/L 2-bromohexanoic acid. [C4-BPP] = 0 mol/L (n = 0), 1.00×10^{-2} mol/L (n = 2), $[Eu]_{ini} = 1.0 \times 10^{-5}$ mol/L. (2-bromohexanoate is abbreviated as 2-bromo).

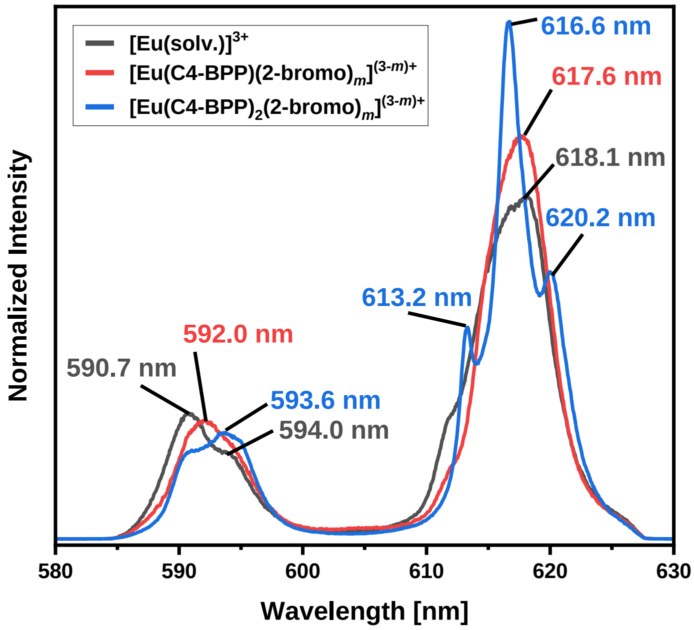

Figure S8: Normalized single component spectra of the $[Eu(C4\text{-}BPP)_n(2\text{-bromohexanoate})_m]^{(3-m)+}$ (n = 0-2, m = 1-3) complexes in methanol containing 1.5 vol.% water and 5.0×10^{-1} mol/L 2-bromohexanoic acid. $[Eu(III)]_{ini} = 1.0 \times 10^{-5}$ mol/L. (2-bromohexanoate is abbreviated as 2-bromo).

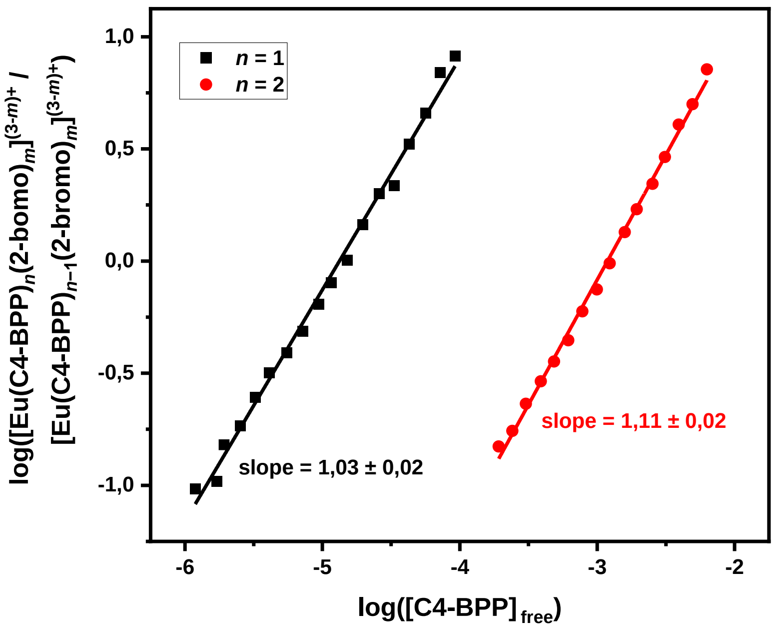

Figure S9: Slope analyses for the complexation of Eu(III) with C4-BPP in methanol containing 1.5 vol.% water and 5.0×10^{-1} mol/L 2-bromohexanoic acid. Plot of log([Eu(C4-BPP)$_n$(2-bromohexanoate)$_m$]$^{(3-m)+}$/[Eu(C4-BPP)$_{n-1}$(2-bromohexanoate)$_m$]$^{(3-m)+}$) (m =1-3) vs. the logarithm of the free C4-BPP concentration (2-bromohexanoate is abbreviated as 2-bromo).

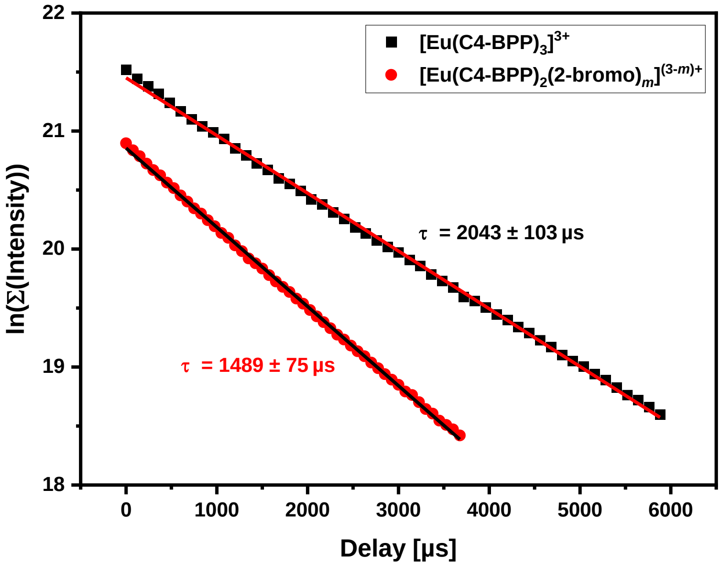

Figure S10: Fluorescence lifetime of [Eu(C4-BPP)$_n$(2-bromohexanoate)$_m$]$^{(3-m)+}$ (n = 2, 3; m = 0-3) in methanol containing 1.5 vol.% water and 3.98 × 10^{-2} mol/L C4-BPP. [2-bromohexanoic acid] = 0 mol/L (n = 0), 5.01 × 10^{-1} mol/L (n = 2), $[Eu]_{ini}$ = 1.0 × 10^{-5} mol/L. (2-bromohexanoate is abbreviated as 2-bromo).