Electronic Supplementary Information

Effect of terbium(III) on the binding of aromatic guests with sodium taurocholate aggregates

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Absorption spectra. The absorption spectra of compounds that do not fluorescence but are present in a solution containing a fluorophore are important to determine if the non-fluorescent compounds interfere with the fluorescence measurement. For steady-state fluorescence experiments the intensity measured is related to the number of photons absorbed by the fluorophore, while for time-resolved experiments the number of photons absorbed only affects the collection time of the kinetics. If an inert compound absorbs at the excitation wavelength of the fluorophore the emission intensity is decreased in the steady-state spectrum (inner filter effect), but the inert compound does not alter the lifetime measured in the time-resolved experiment.

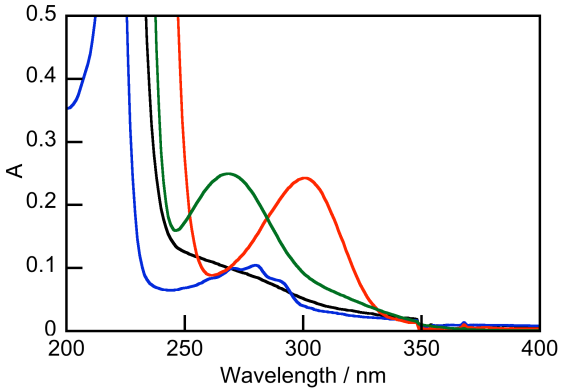

Fig. S1 Absorption spectra in water of 10 μM NpOH (blue), 10 mM nitromethane (green), 10 mM Tb^{3+} (red) and 40 mM NaTC (black).

Time-Resolved Fluorescence Quenching Plots for Py.

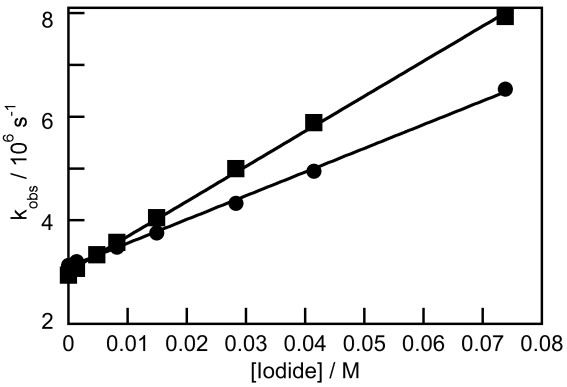

Fig. S2 Quenching plot for iodide anion quenching of the fluorescence of Py in the presence of 40 mM NaTC in the absence (●) or presence (■) of 10 mM Tb^{3+}.

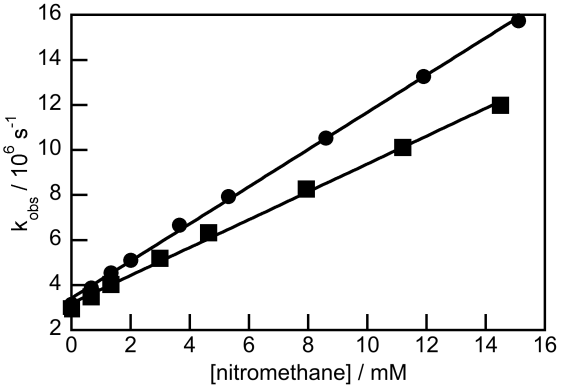

Fig. S3 Quenching plot for nitromethane quenching of the fluorescence of Py in the presence of 40 mM NaTC in the absence (●) or presence (■) of 10 mM Tb^{3+}.

Time-Resolved Fluorescence Quenching Plots For EtNp.

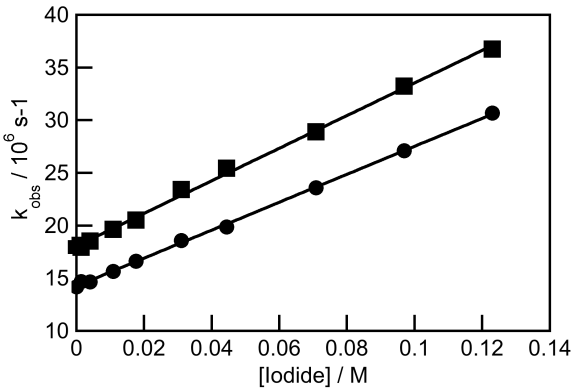

Fig. S4 Quenching plot for iodide anion quenching of the fluorescence of EtNp in the presence of 40 mM NaTC in the absence (●) or presence (■) of 10 mM Tb^{3+}.

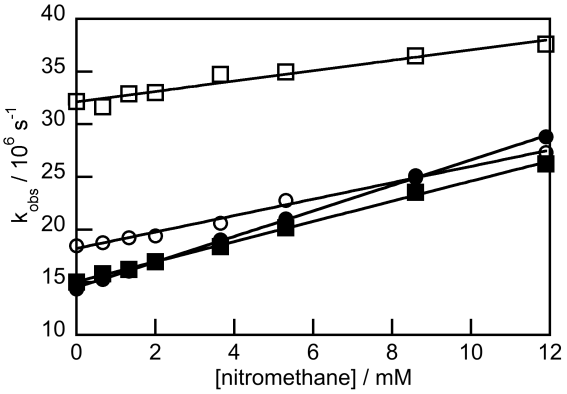

Fig. S5 Quenching plot for nitromethane quenching of the fluorescence of EtNp in the presence of 40 mM NaTC in the presence of 0 mM (●), 2 mM (■), 10 mM (○) or 50 mM Tb^{3+} (□).

Time-Resolved Fluorescence Quenching Plots For NpOH.

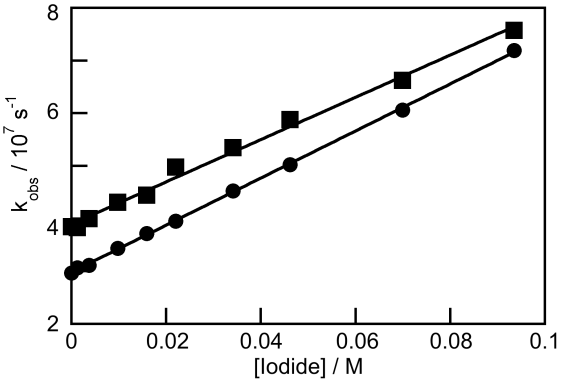

Fig. S6 Quenching plot for iodide anion quenching of the fluorescence of NpOH in the presence of 40 mM NaTC in the absence (●) or presence (■) of 10 mM Tb^{3+}.

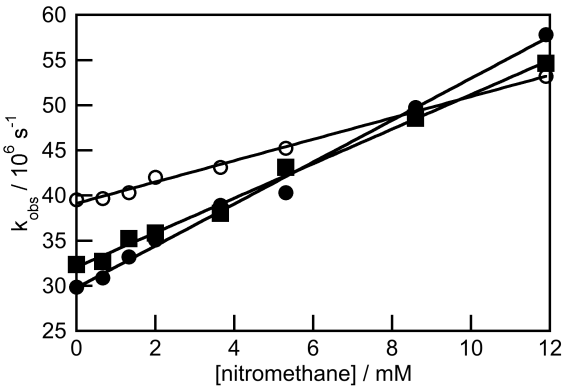

Fig. S7 Quenching plot for nitromethane quenching of the fluorescence of NpOH in the presence of 40 mM NaTC in the presence of 0 mM (●), 2 mM (■) or 10 mM Tb^{3+} (○).

Fitting of LFP quenching plots. Fits were considered adequate when the distribution of data points around the fit were random. Detailed discussions on the adequacy of fits can be found in previous work using cyclodextrins[1, 2] or bile salts[3] as hosts.

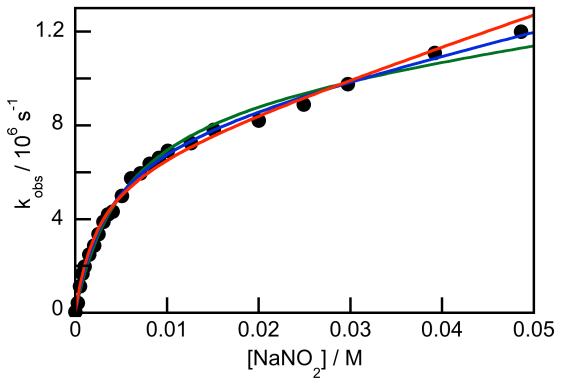

Fig. S8 Fits of the LFP quenching plot for nitrite quenching of NpOH in 40 mM NaTC when k_q^H is fixed showing adequate (blue, $k_q^H = 9 \times 10^7$ M^{-1} s^{-1}) and inadequate fits (red, $k_q^H = 1.3 \times 10^8$ M^{-1} s^{-1}; green, $k_q^H = 5 \times 10^7$ M^{-1} s^{-1}). Recovered k_- and k_+ values for each of these fits are shown in Table S1.

Table S1. Association and dissociation rate constants recovered for the triplet excited state NpOH in 40 mM NaTC in the absence Tb^{3+} when k_q^H is fixed.

Fixed k_q^H /10^7 M^{-1} s^{-1}	k_- /10^6 s^{-1}	k_+/N /10^8 M^{-1} s^{-1}
5	9.8 ± 0.2	4.5 ± 0.3
9	8.0 ± 0.1	3.2 ± 0.2
13	6.5 ± 0.2	2.2 ± 0.2

References

1. T. C. Barros, K. Stefaniak, J. F. Holzwarth and C. Bohne, Complexation of naphthylethanols with β-Cyclodextrin, *J. Phys. Chem. A*, 1998, **102**, 5639-5651.
2. T. C. S. Pace and C. Bohne, Temperature effects on xanthone-β-cyclodextrin binding dynamics, *Can. J. Chem.*, 2011, **89**, 395-401.
3. O. Rinco, M. C. Nolet, R. Ovans and C. Bohne, Probing the Binding Dynamics to Sodium Cholate Aggregates using Naphthalene Derivatives as Guests, *Photochem. Photobiol. Sci.*, 2003, **2**, 1140-1151.