

Electronic Supplementary Information for

The anion impact on the self-assembly of naphthalene diimide diimidazolium salts

Floriana Billeci, Francesca D'Anna,* Isabella Chiarotto, Marta Feroci and Salvatore Marullo

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Table S1. Position of main emission bands detected both in solution and solid state as a function of salt and solvent nature.

	1,4-Dioxane	THF	Acetone	DMF
$[\text{C}_8\text{NDI}][\text{BF}_4]$		395.8 ^a 408.0 ^b 12.2 ^c	395.8 ^a 443.4 ^b 47.6 ^c	
$[\text{C}_8\text{NDI}][\text{NTf}_2]$	394.9 ^a 411.9 ^b 17.0 ^c	394.9 ^a 410.0 ^b 15.1 ^c		395.8 ^a 395.8 ^b 0 ^c
$[\text{C}_8\text{NDI}][\text{I}]$		375.0 ^a 408.0 ^b 33 ^c		

a = λ_{MAX} in solid state; b = λ_{MAX} in solution; c = $\Delta\lambda = (\lambda_{\text{MAX,sol}} - \lambda_{\text{MAX, solid state}})$

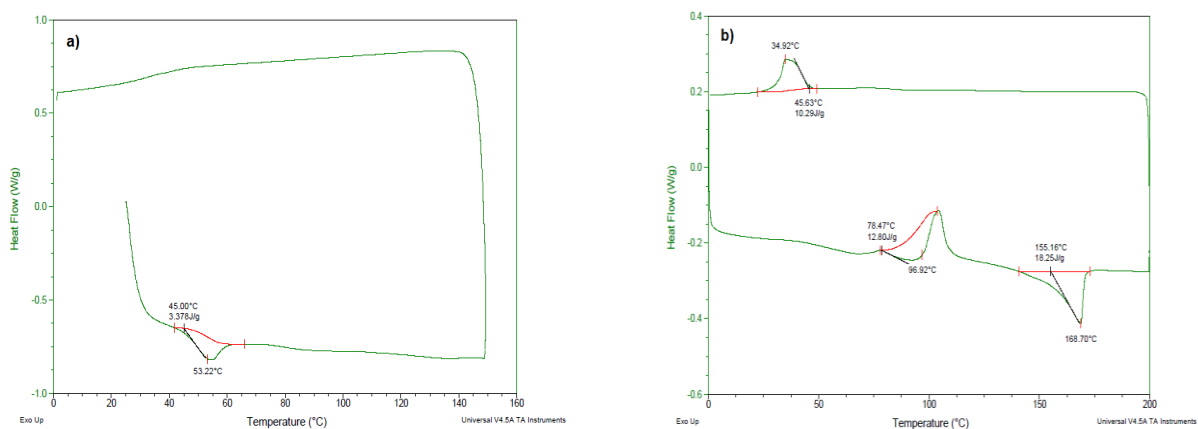


Figure S1. DSC thermograms for a) $[\text{C}_8\text{NDI}][\text{BF}_4]$ and b) $[\text{C}_8\text{NDI}][\text{NTf}_2]$

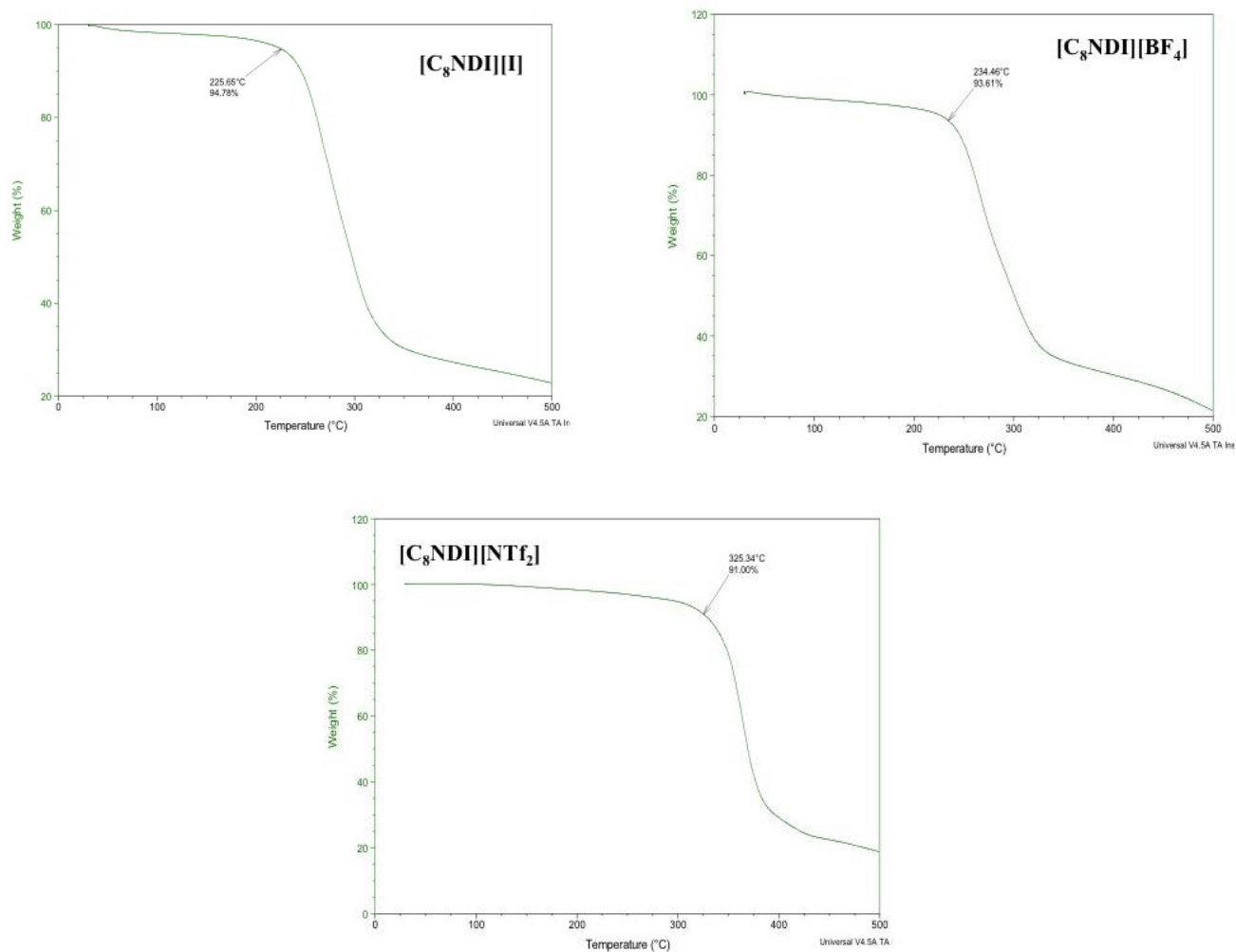


Figure S2. TGA traces.

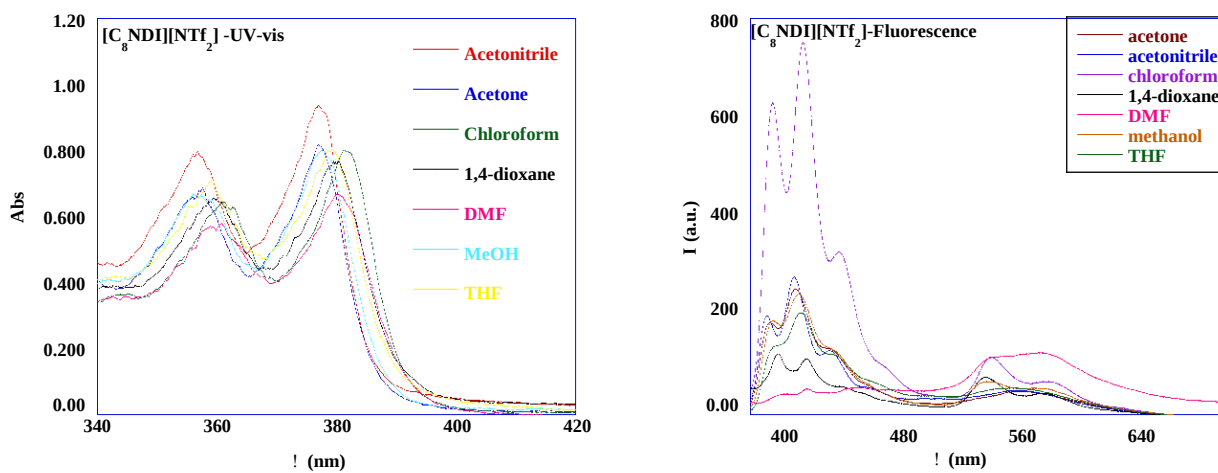
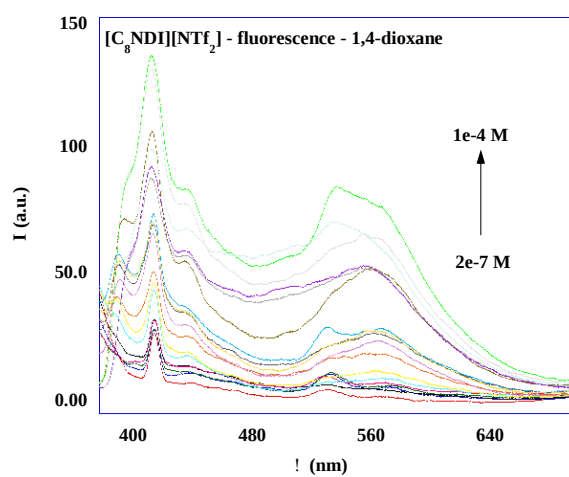
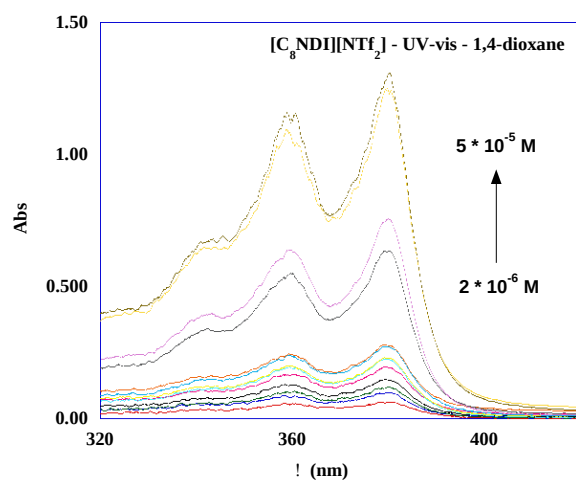
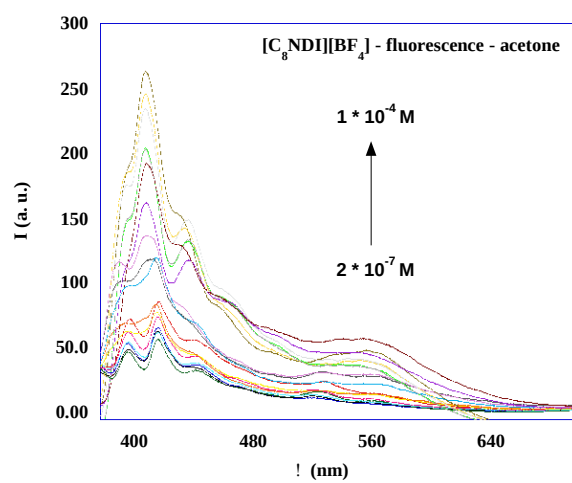
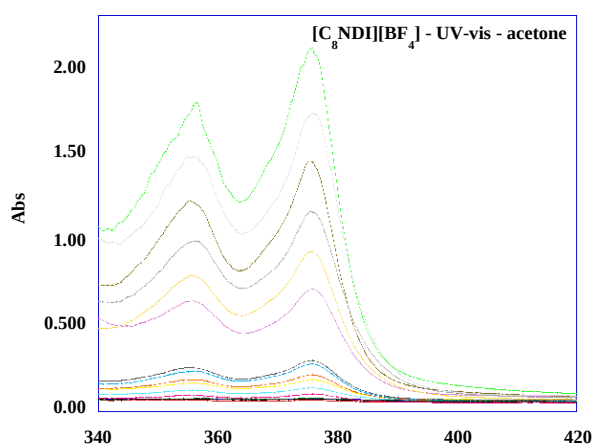


Figure S3. UV-vis and fluorescence spectra of $[C_8NDI][NTf_2]$ as function of solvent recorded at $5 \cdot 10^{-5}$ M.



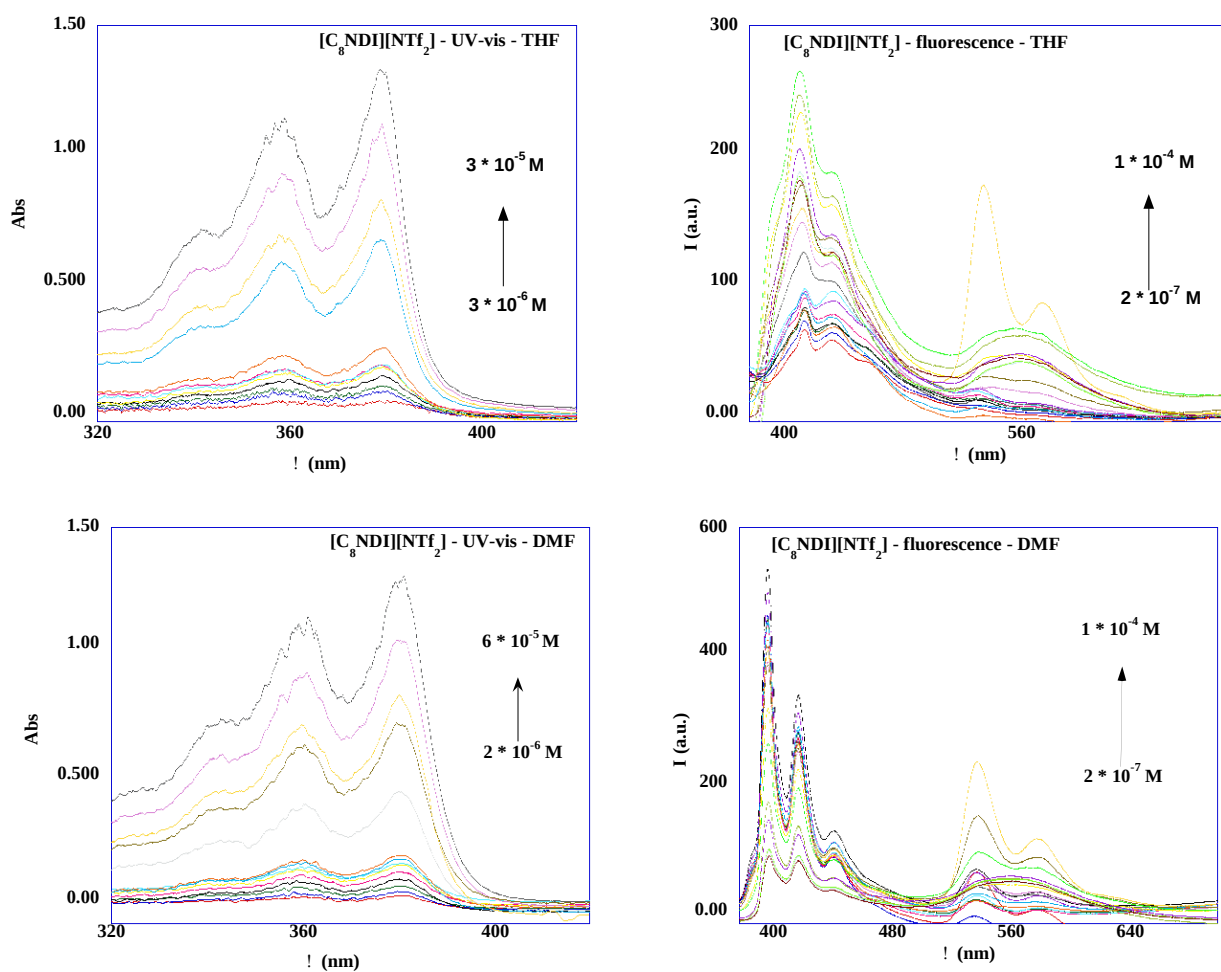
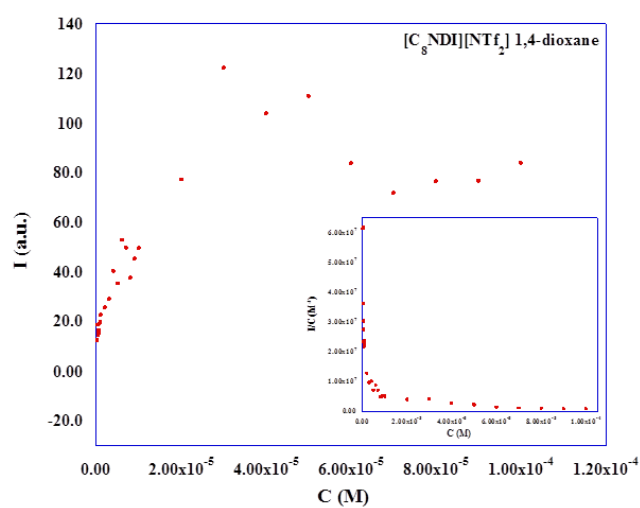
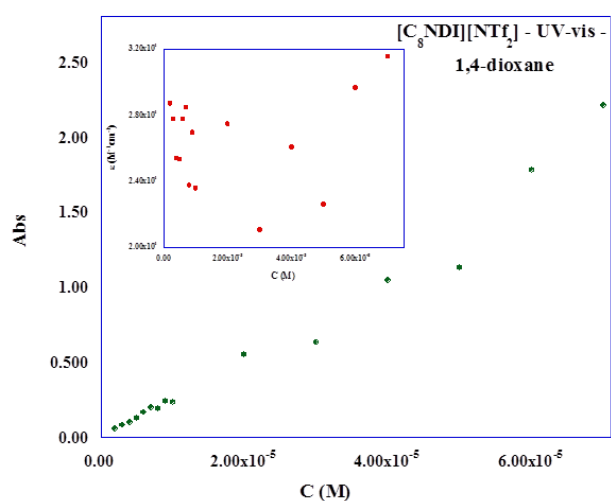
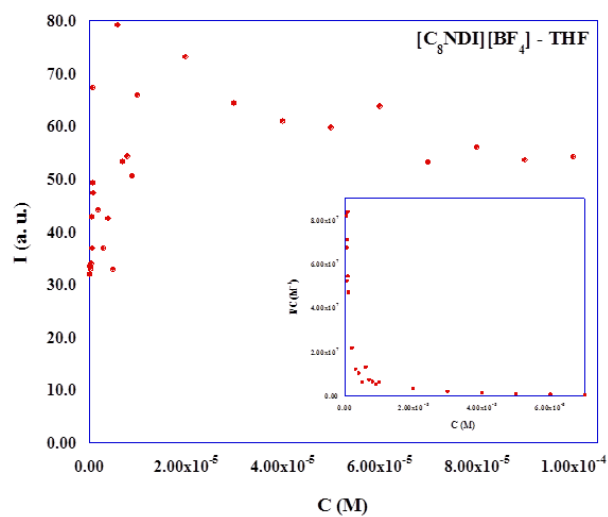
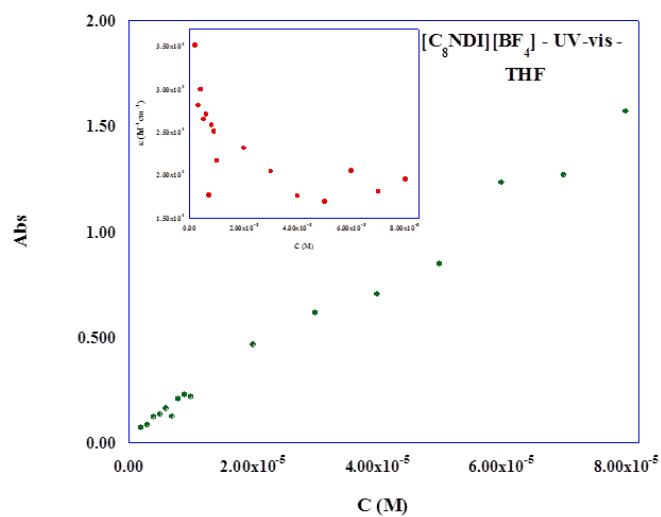
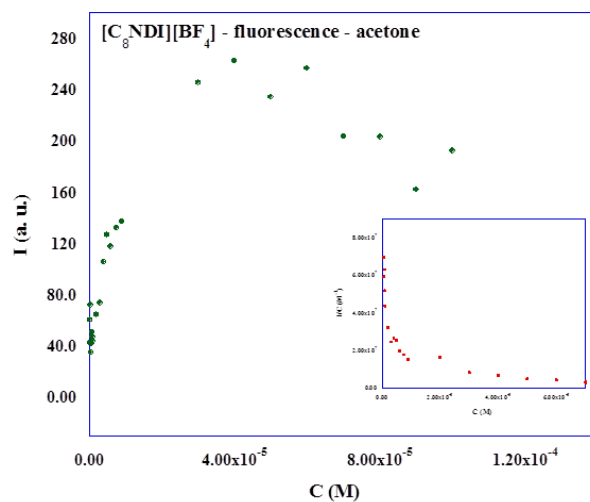
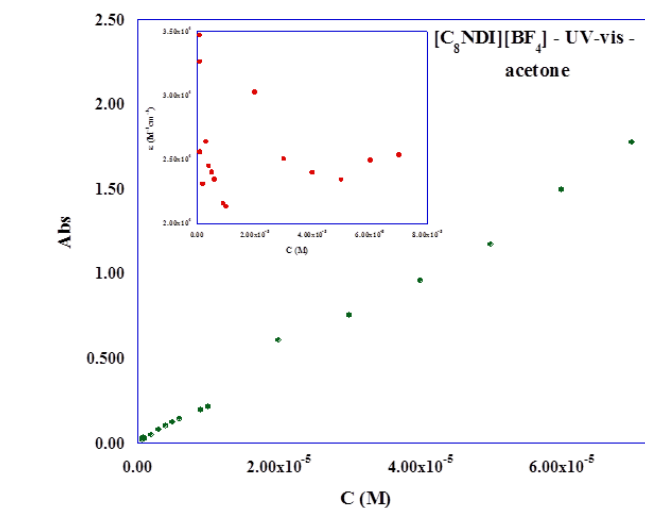


Figure S4. UV-vis and fluorescence spectra ($\lambda_{\text{ex}} = 363 \text{ nm}$) of salts as a function of concentration and solvent.



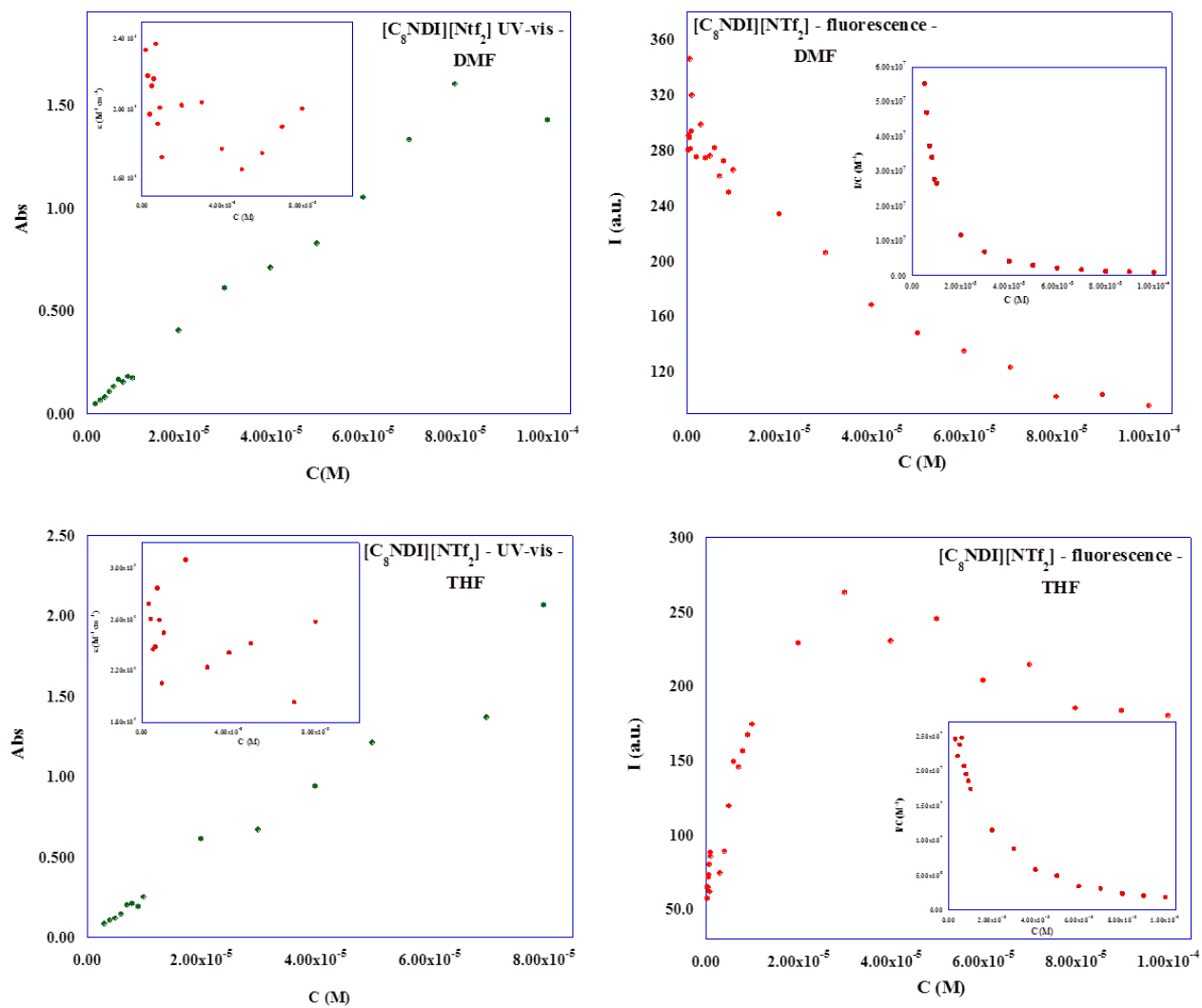


Figure S5. Absorbance and fluorescence intensity (arbitrary units) as a function of concentration and solvent. (Inset: trend of ϵ as a function of concentration; trend of I/C as function of concentration).

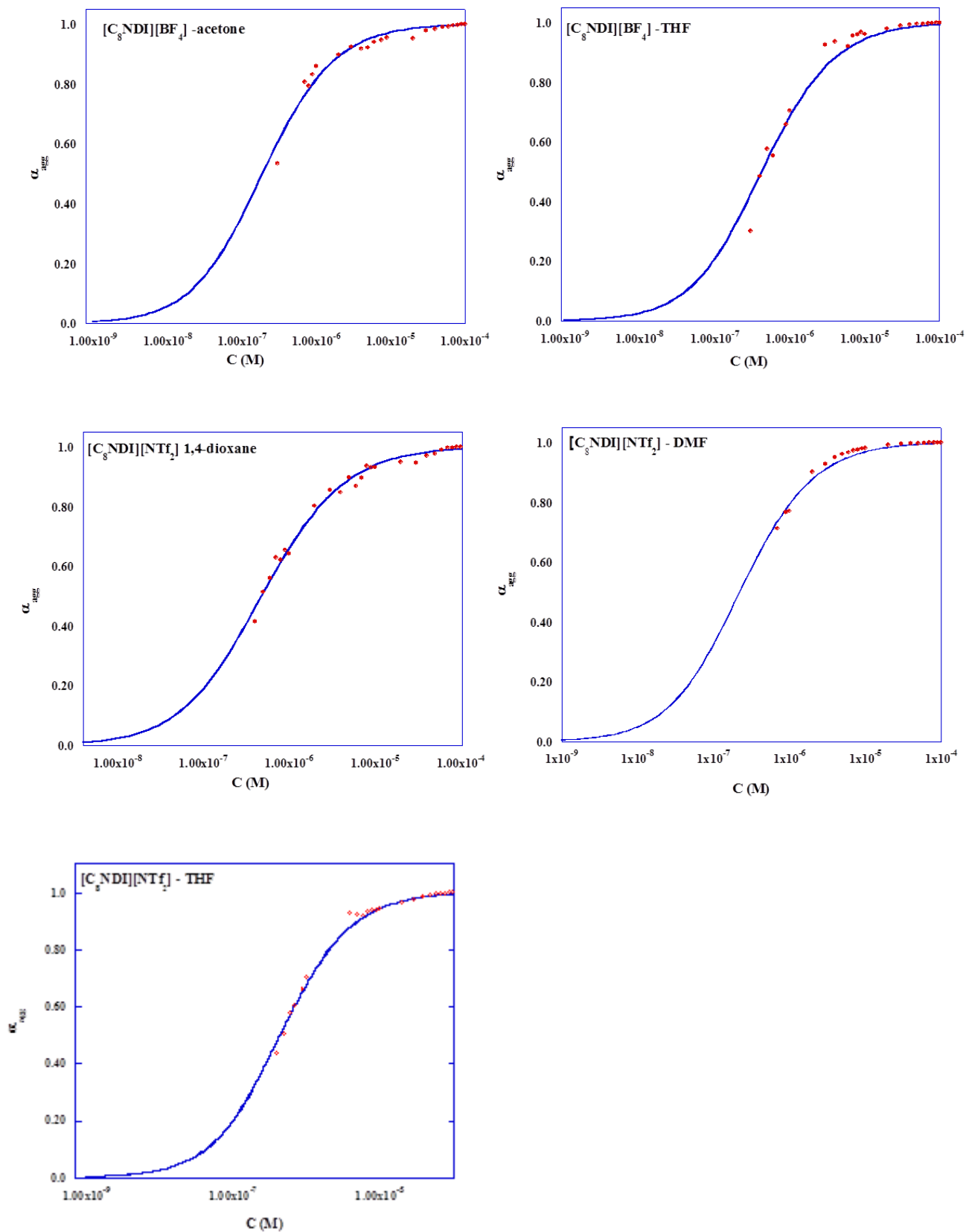


Figure S6. Plot of α_{agg} as a function of concentration and solvent ($\forall$ were calculated at the following wavelengths: $[C_8NDI][BF_4]$ /THF, $\lambda = 413.5$ nm; $[C_8NDI][BF_4]$ /acetone, $\lambda = 408$ nm; $[C_8NDI][NTf_2]$ /1,4-dioxane, $\lambda = 419$ nm; $[C_8NDI][NTf_2]$ /DMF, $\lambda = 416$ nm $[C_8NDI][NTf_2]$ /THF, $\lambda = 409$ nm).

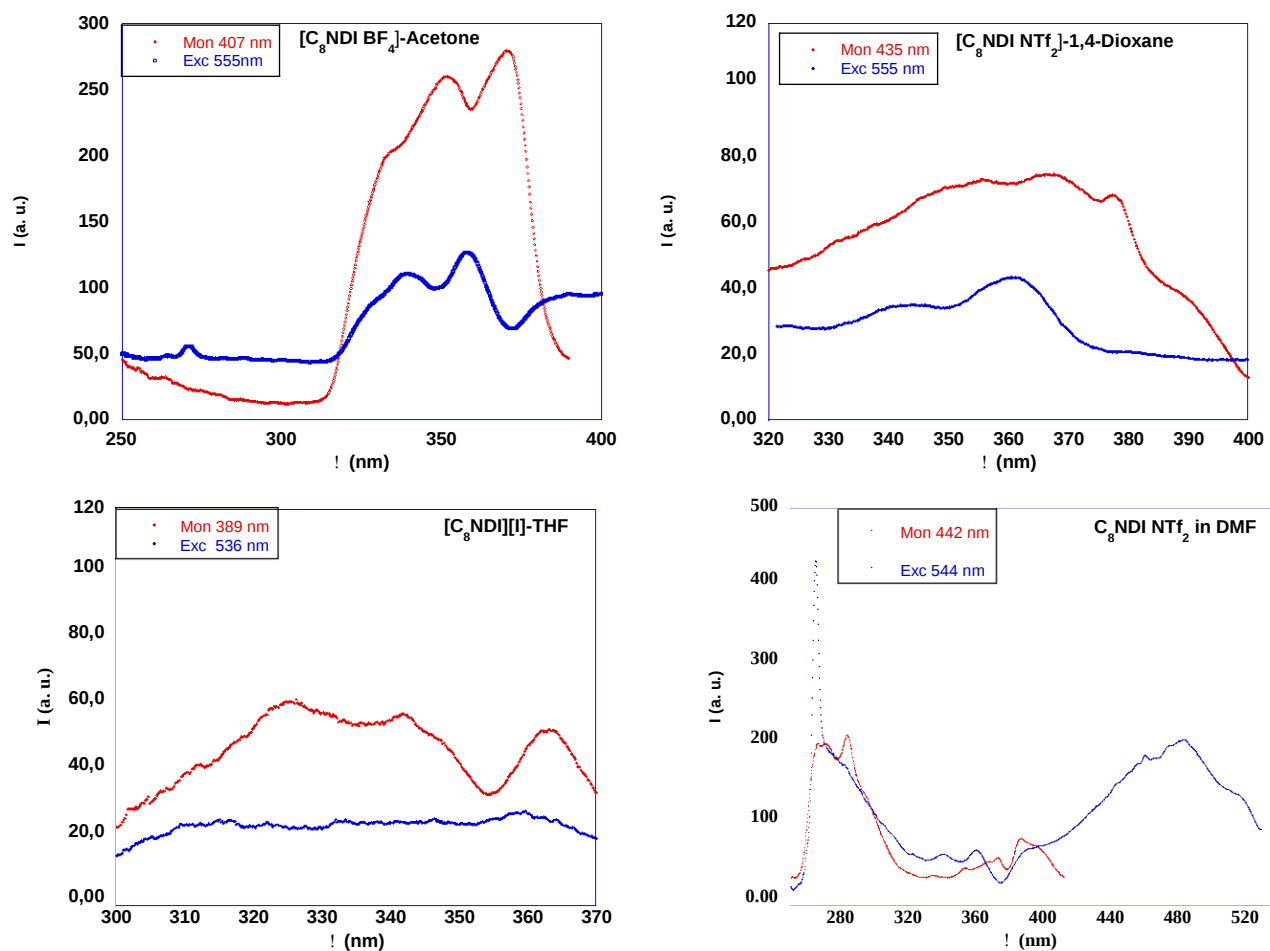


Figure S7. Excitation spectra as a function of solvent and salts recorded at $5 \cdot 10^{-5}$ M monitoring the emission at different λ values.

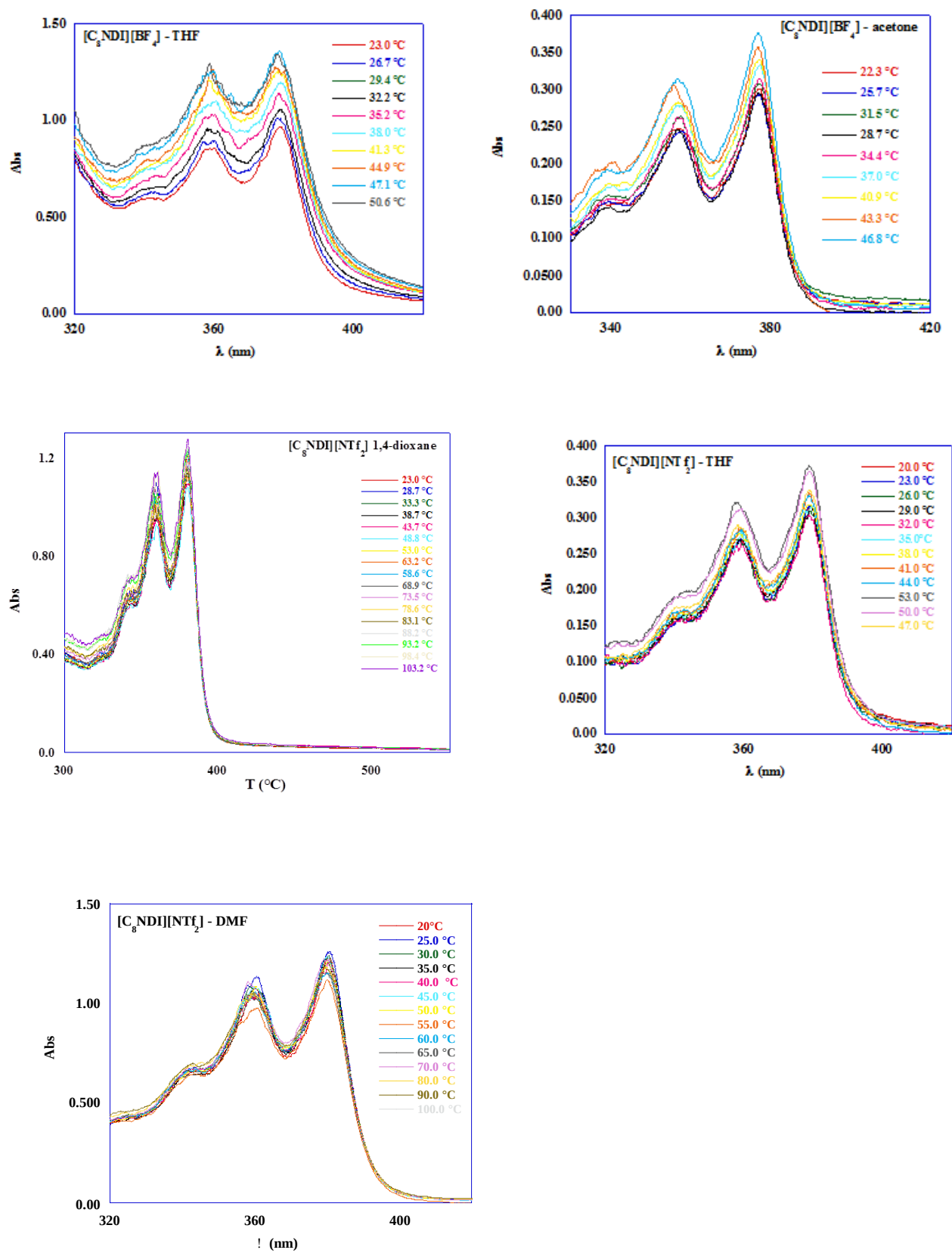
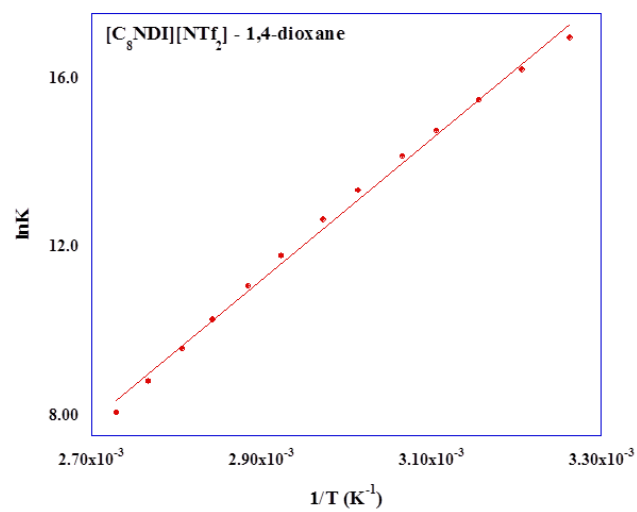
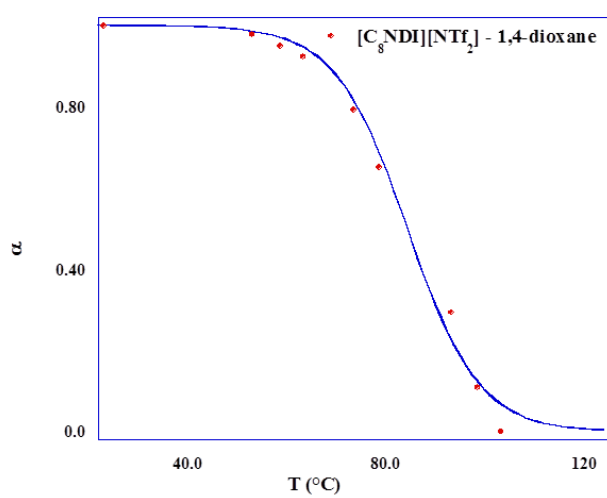
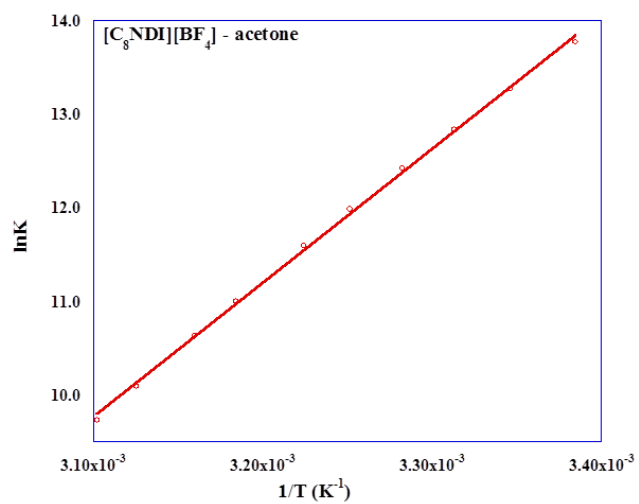
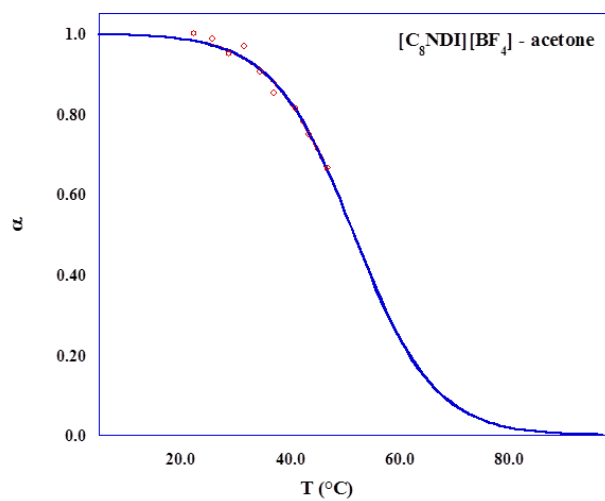
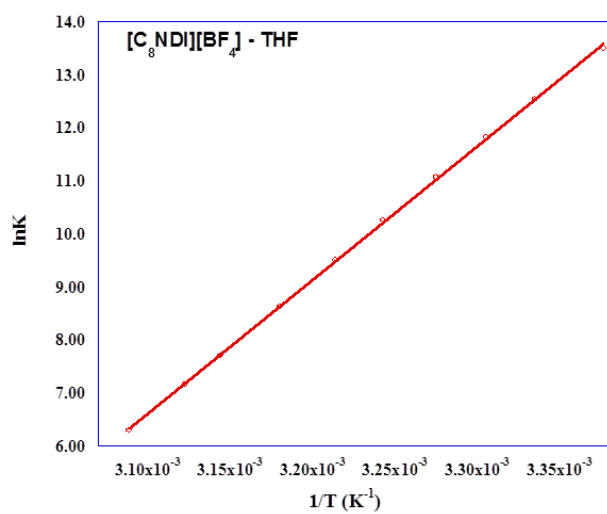
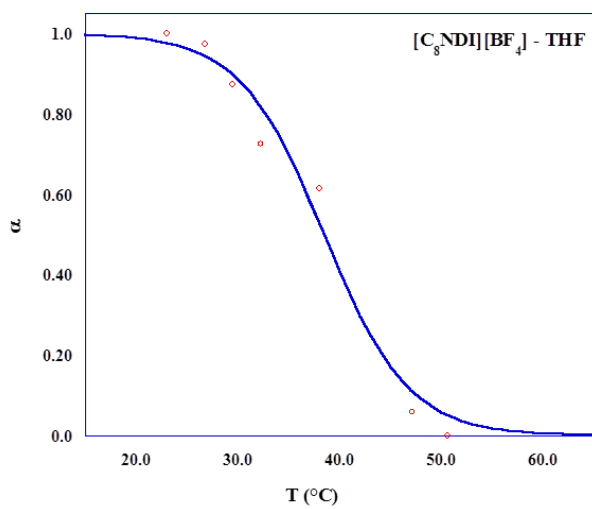


Figure S8. UV-vis spectra at fixed concentration ($5 \cdot 10^{-5}$ M) as a function of temperature.



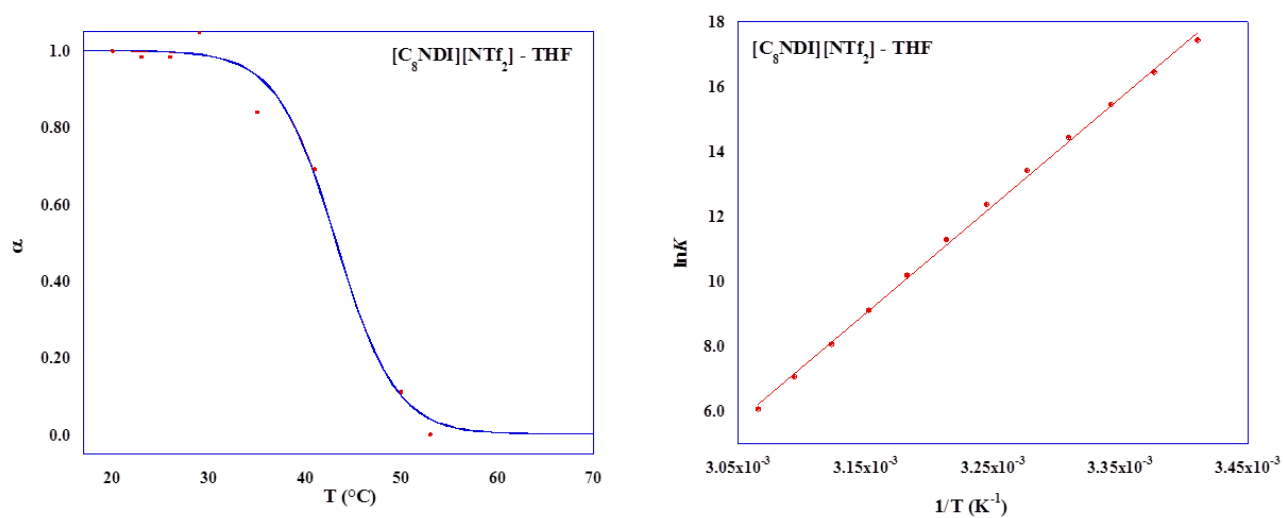


Figure S9. α and van't Hoff plots of UV-vis analysis at variable temperature and fixed concentration ($5 \cdot 10^{-5}$ M) (∇ were calculated at the following wavelengths: $[\text{C}_8\text{NDI}][\text{BF}_4]/\text{THF}$, $\lambda = 379$ nm; $[\text{C}_8\text{NDI}][\text{BF}_4]/\text{acetone}$, $\lambda = 356$ nm; $[\text{C}_8\text{NDI}][\text{NTf}_2]/1,4\text{-dioxane}$, $\lambda = 354$ nm; $[\text{C}_8\text{NDI}][\text{NTf}_2]/\text{THF}$, $\lambda = 378.4$ nm).

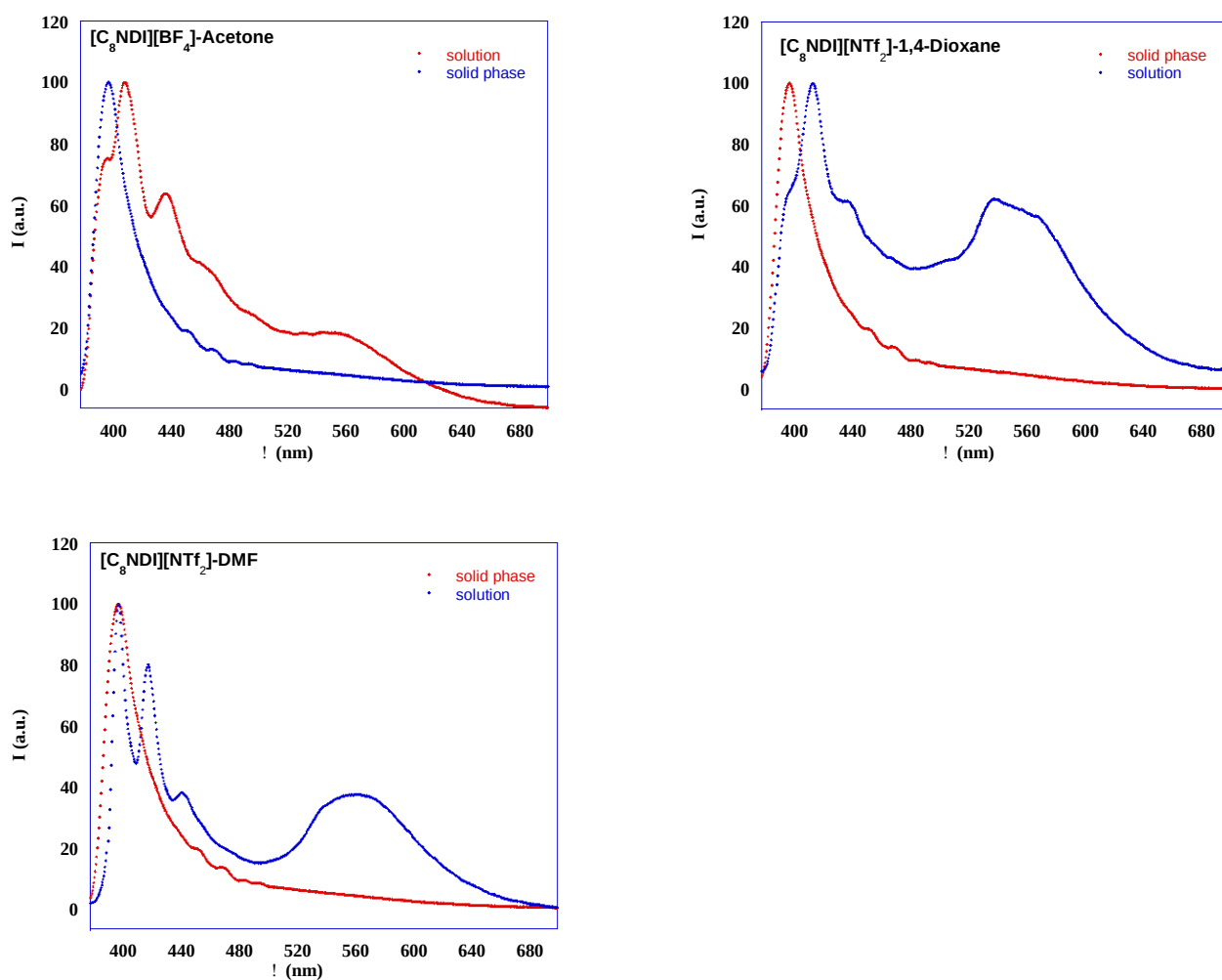


Figure S10. Superimposed emission spectra recorded both in solution ($5 \cdot 10^{-5}$ M) and solid state.

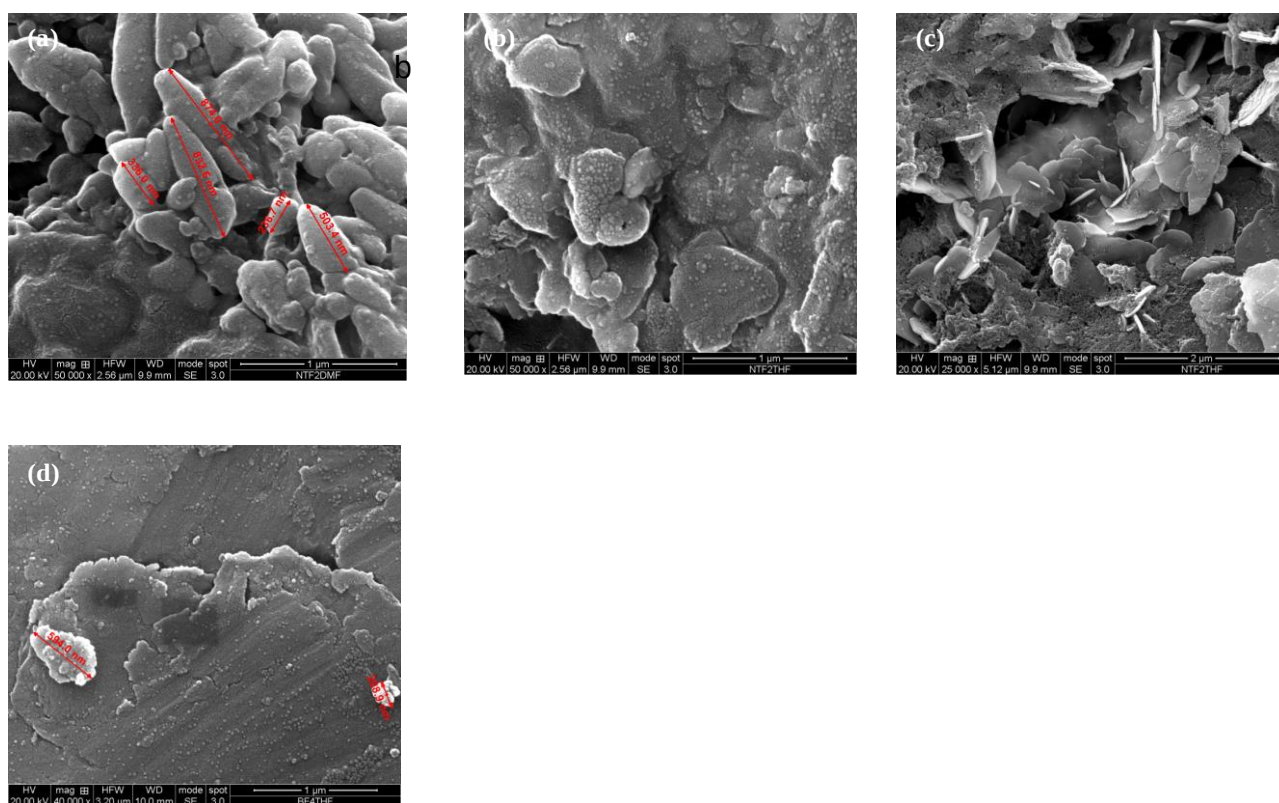
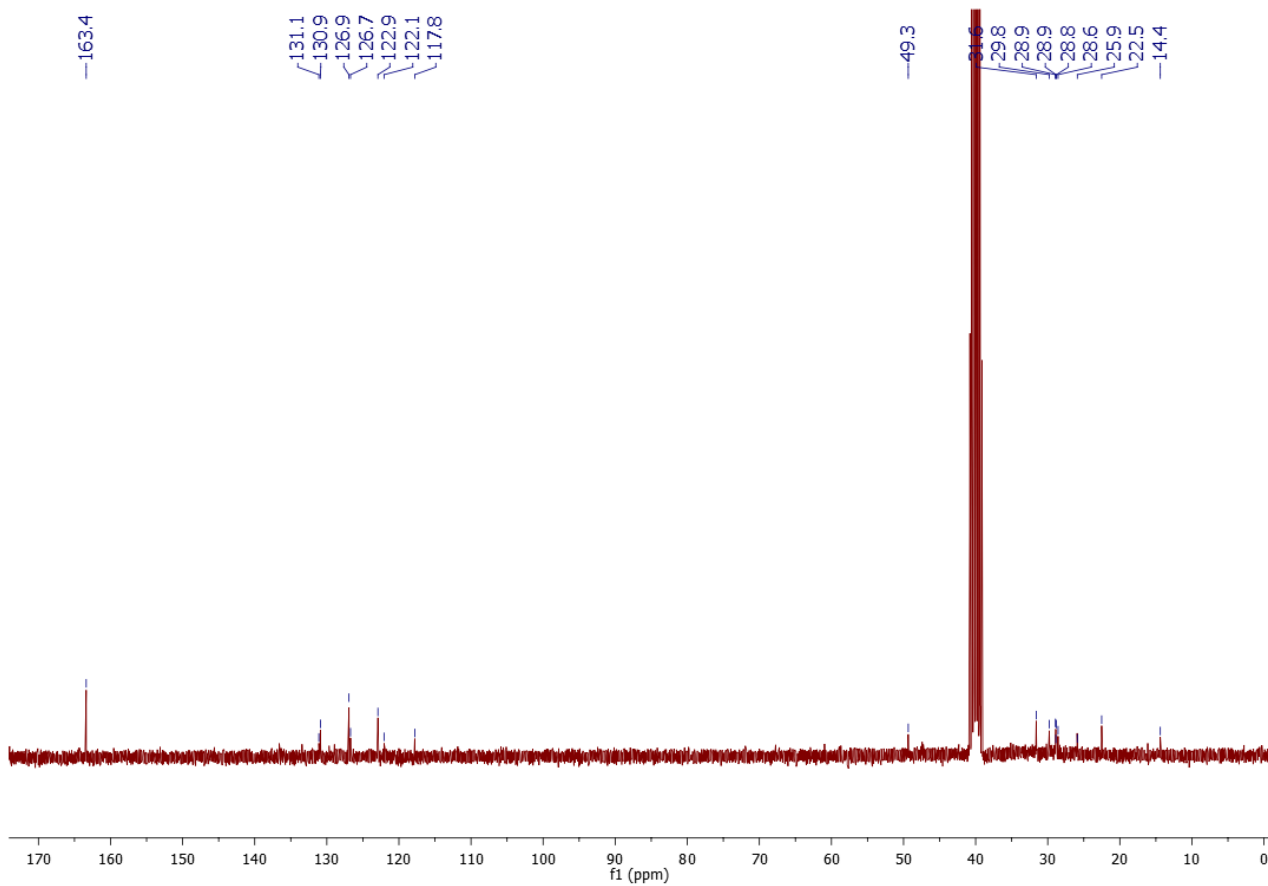


Figure S11. SEM images collected from casting of (a) DMF solution of $[\text{C}_8\text{NDI}][\text{NTf}_2]$; (b) THF solution of $[\text{C}_8\text{NDI}][\text{NTf}_2]$ and (c) THF solution of $[\text{C}_8\text{NDI}][\text{BF}_4]$ ($5 \cdot 10^{-5}\text{M}$).



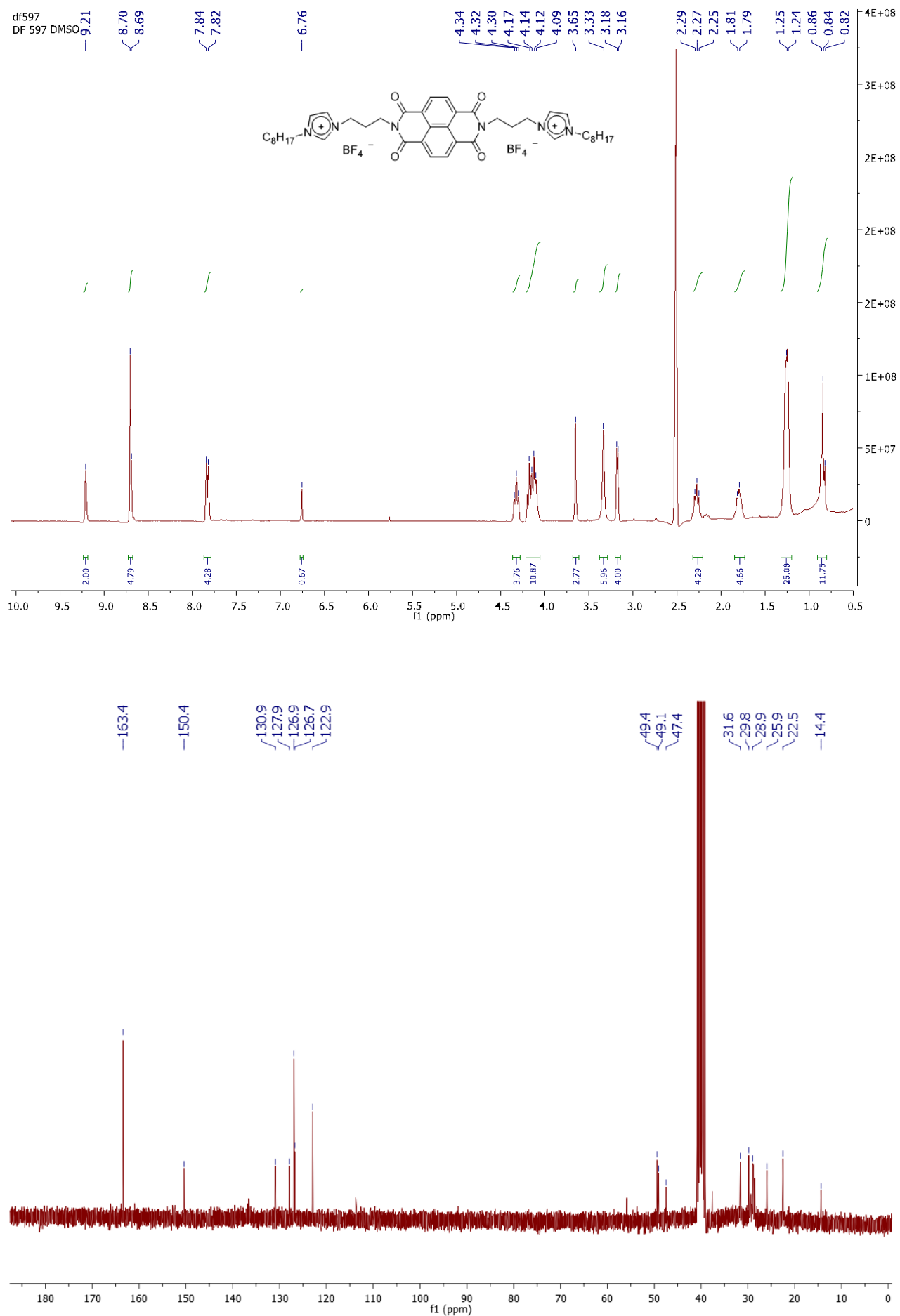


Figure S12. ¹H NMR and ¹³C NMR spectra of the synthesized salts.