Supplementary Information

Multi-Substituted Triazatruxene-Functionalized Pyrene Derivatives as Efficient Organic Laser Gain Media

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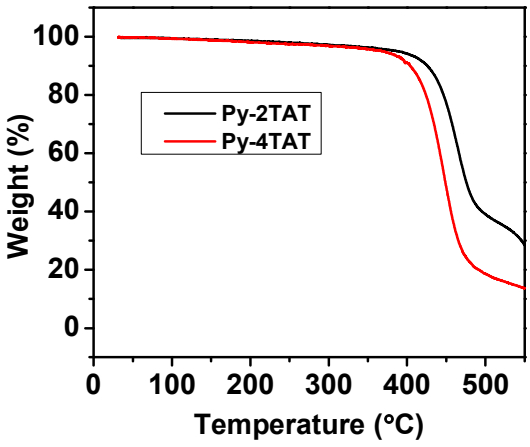


Figure S1.TGA thermograms of **Py-nTAT**.

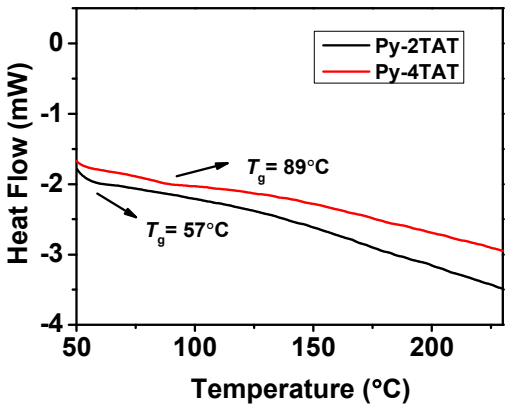


Figure S2. DSC traces of **Py-nTAT**.

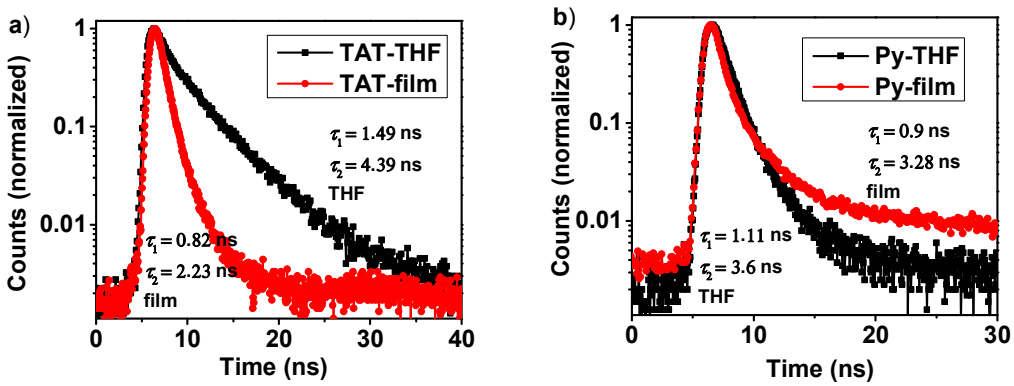


Figure S3. Fluorescence decay of (a) **TAT** and (b) **Py** in THF and film states.

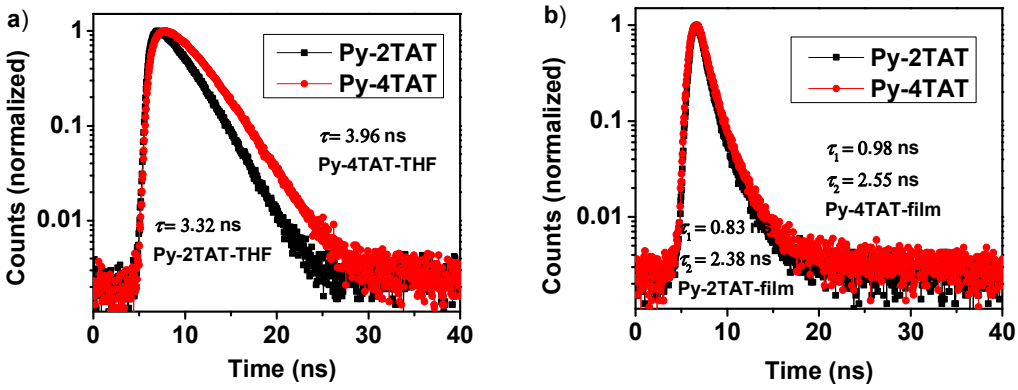


Figure S4. Fluorescence decay of **Py-nTAT** in (a) THF and (b) film states.

Table S1. The PL lifetimes of **Py** and **TAT**.

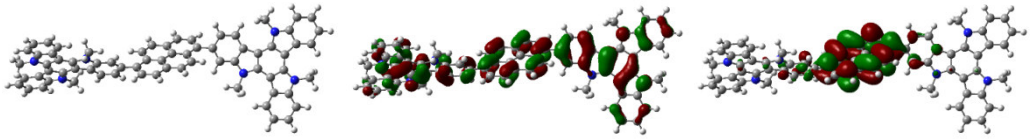
Compound	τ_1 (ns)[a]	τ_2 (ns)[a]	τ_1 (ns)[b]	τ_2 (ns)[b]
TAT	1.49 (22.53%)	4.39 (77.47%)	0.82 (76.52%)	2.23 (23.48%)
Py	1.11 (83.72%)	3.6 (16.28%)	0.9 (85.30%)	3.28 (14.70%)

[a] Measured in THF; [b] Measured in film states.

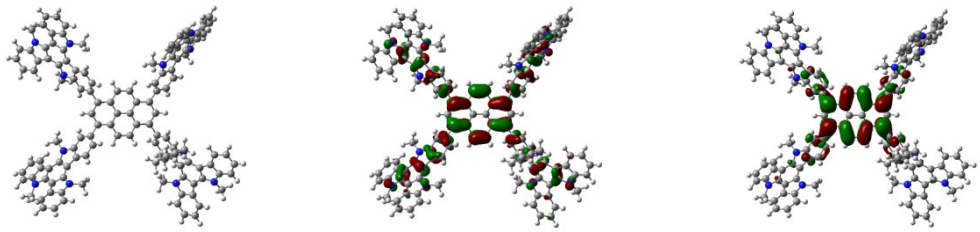
Table S2. The PL lifetimes of **Py-2TAT** and **Py-4TAT** films.

Compound	τ_1 (ns)	τ_2 (ns)	$\langle\tau\rangle$ (ns)[a]	χ^2
Py-2TAT	0.83 (69.40%)	2.38 (30.60%)	1.30	1.15
Py-4TAT	0.98 (71.71%)	2.55 (28.29%)	1.42	1.17

[a] the average lifetime



Py-2TAT **Py-2TAT**, HOMO **Py-2TAT**, LUMO



Py-4TAT **Py-4TAT**, HOMO **Py-4TAT**, LUMO

Figure S5. Optimized geometries and calculated frontier orbitals of **Py-2TAT** and **Py-4TAT**.

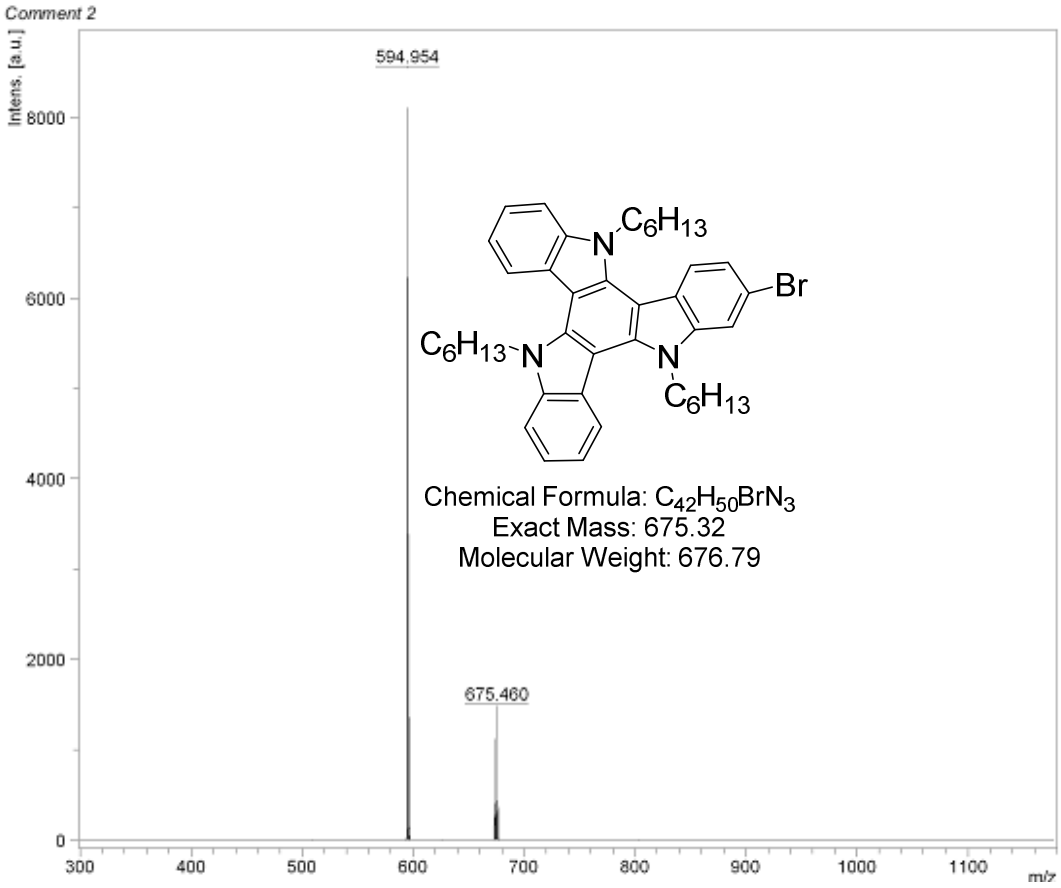


Figure S6. MALDI-TOF mass spectrum of **TAT-Br (2)**.

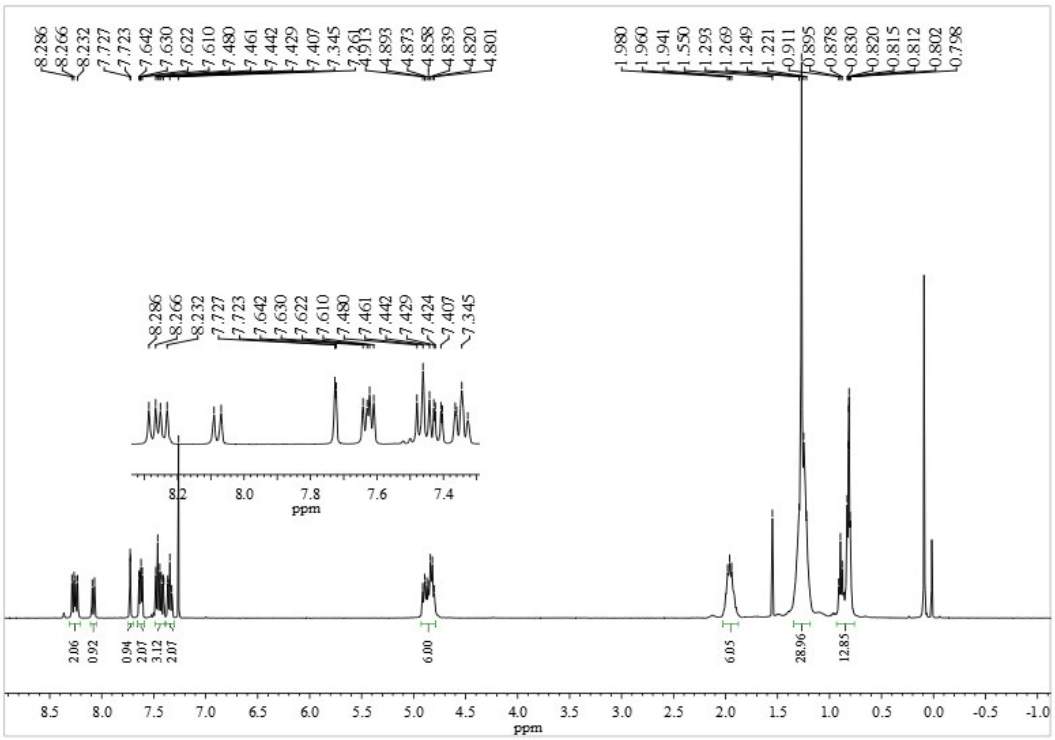


Figure S7. ^{1}H NMR spectrum of **2**.

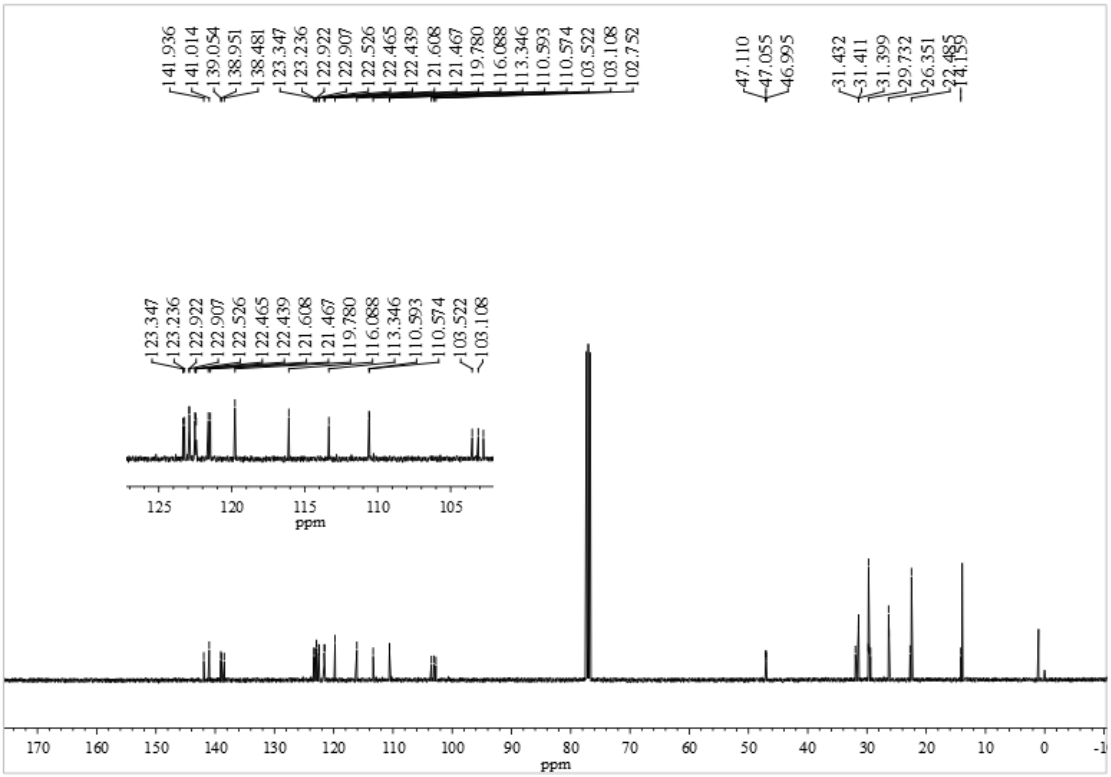


Figure S8. ^{13}C NMR spectrum of **2**.

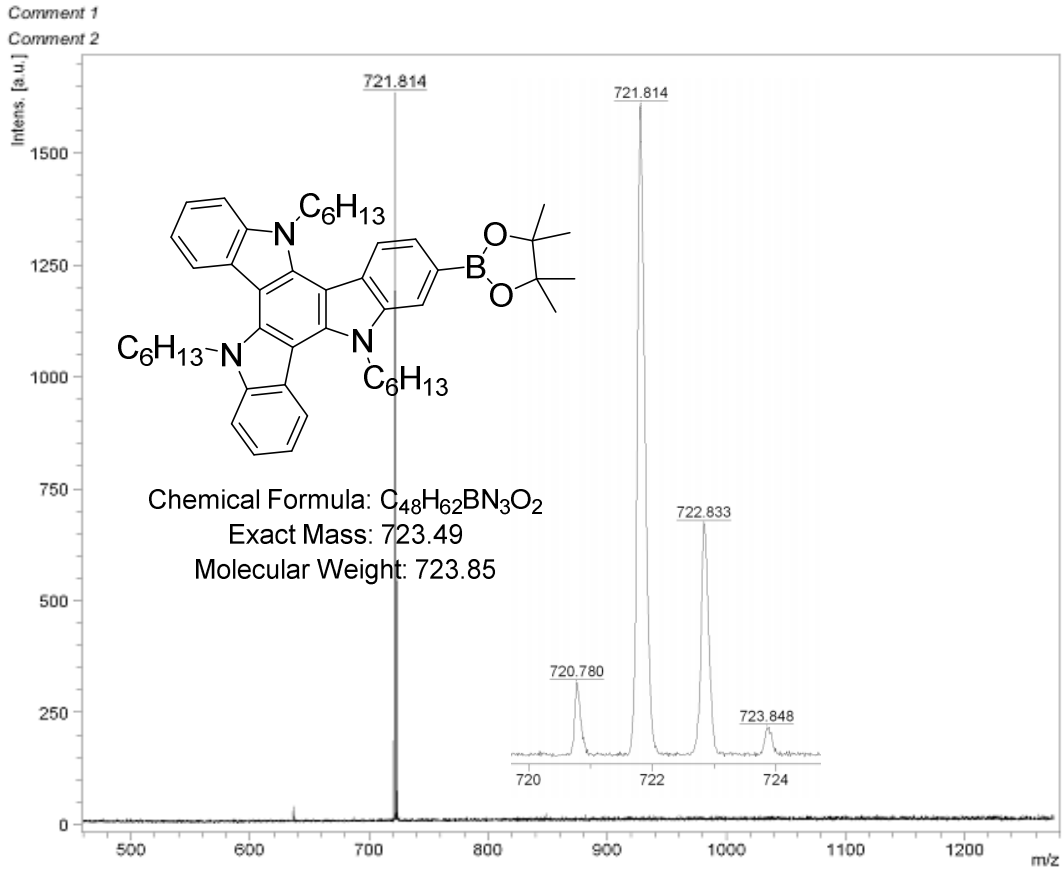


Figure S9. MALDI-TOF mass spectrum of **3**.

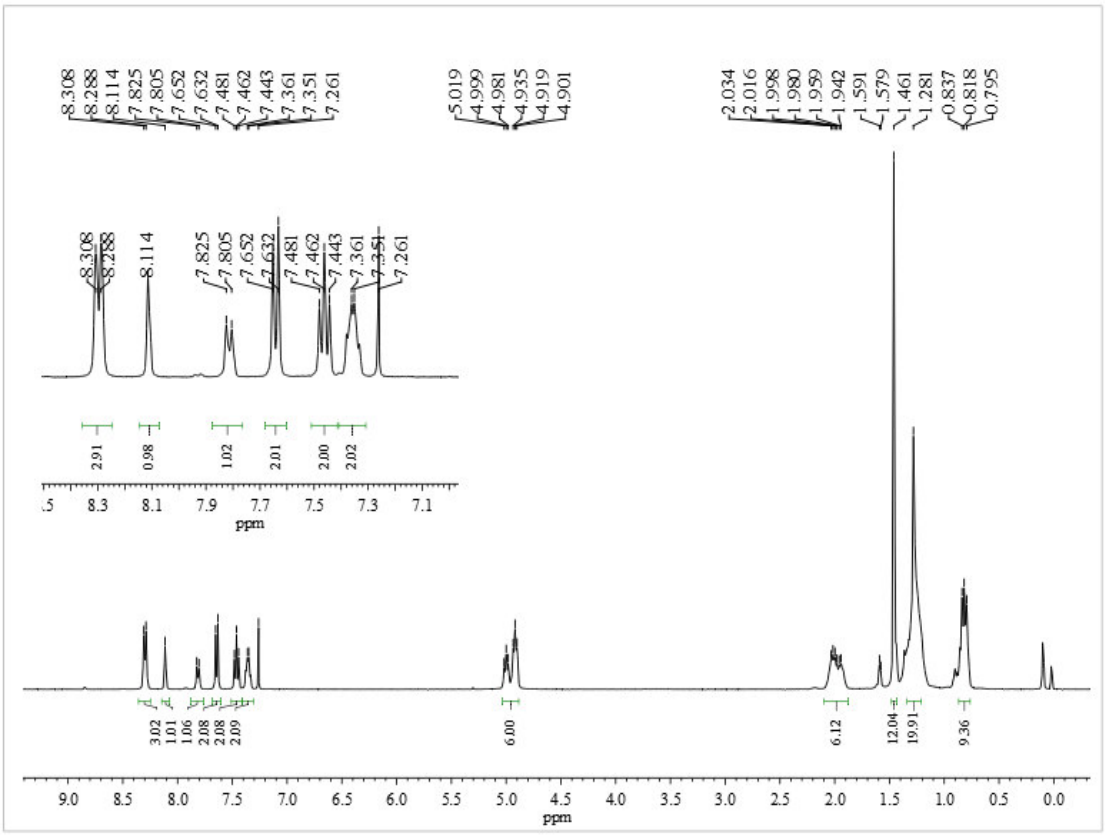


Figure S10. ^{1}H NMR spectrum of **3**.

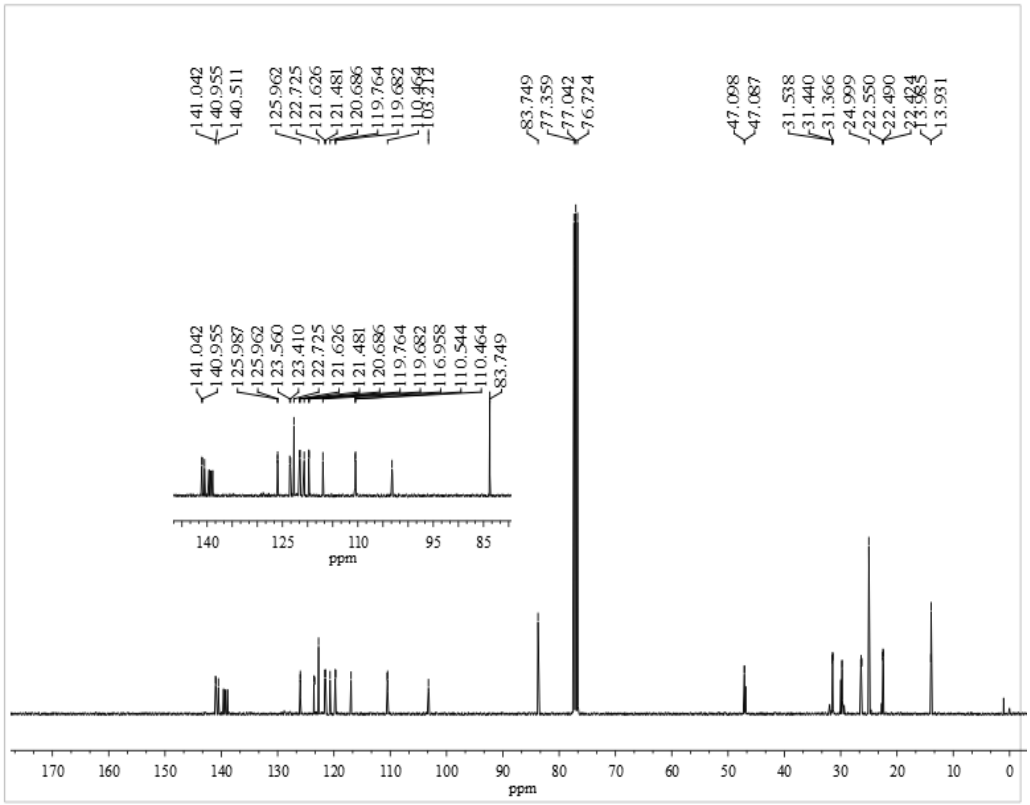


Figure S11. ^{13}C NMR spectrum of **3**.

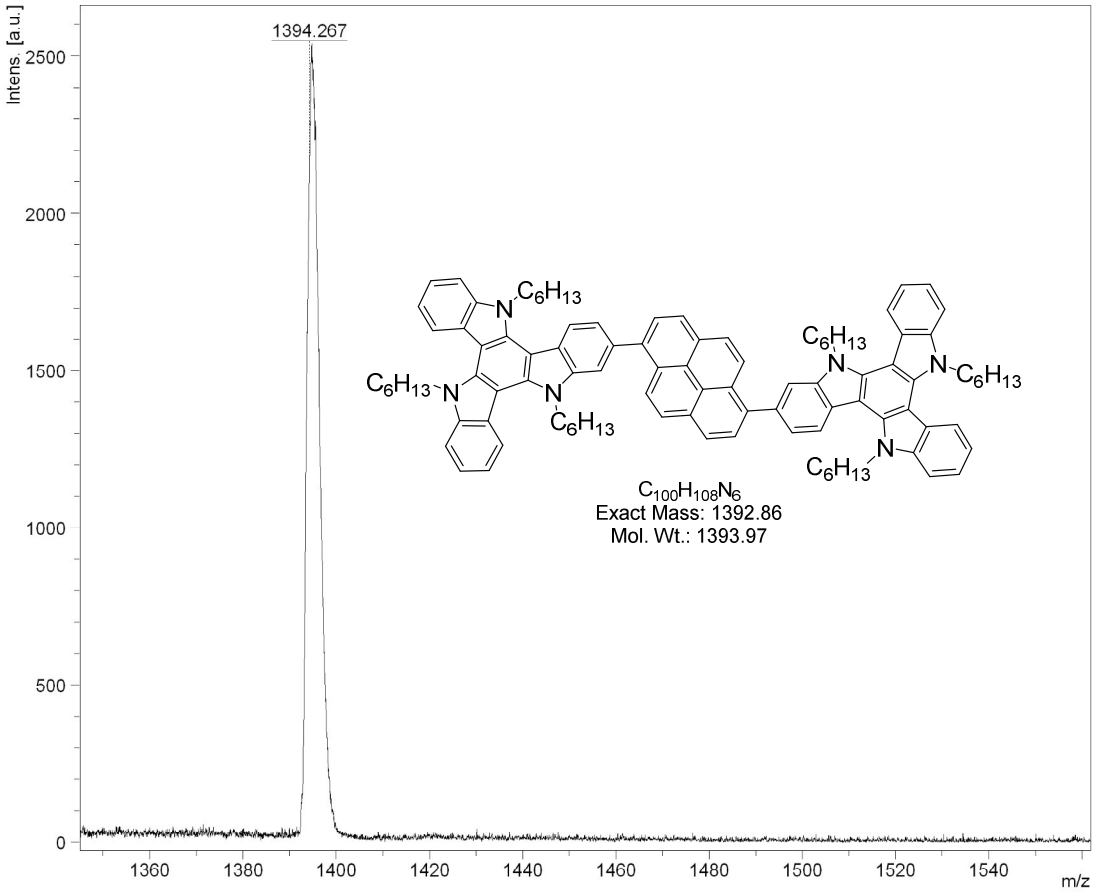


Figure S12. MALDI-TOF mass spectrum of **Py-2TAT**.

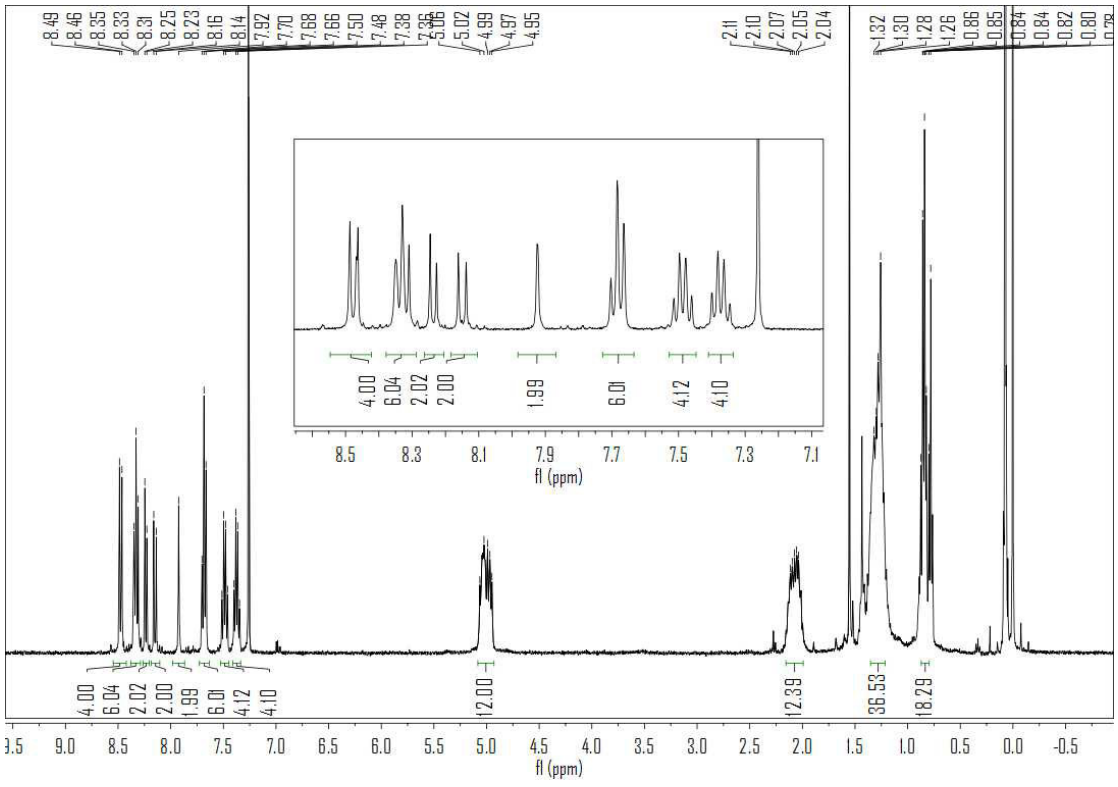


Figure S13. ^{1}H NMR spectrum of **Py-2TAT**.

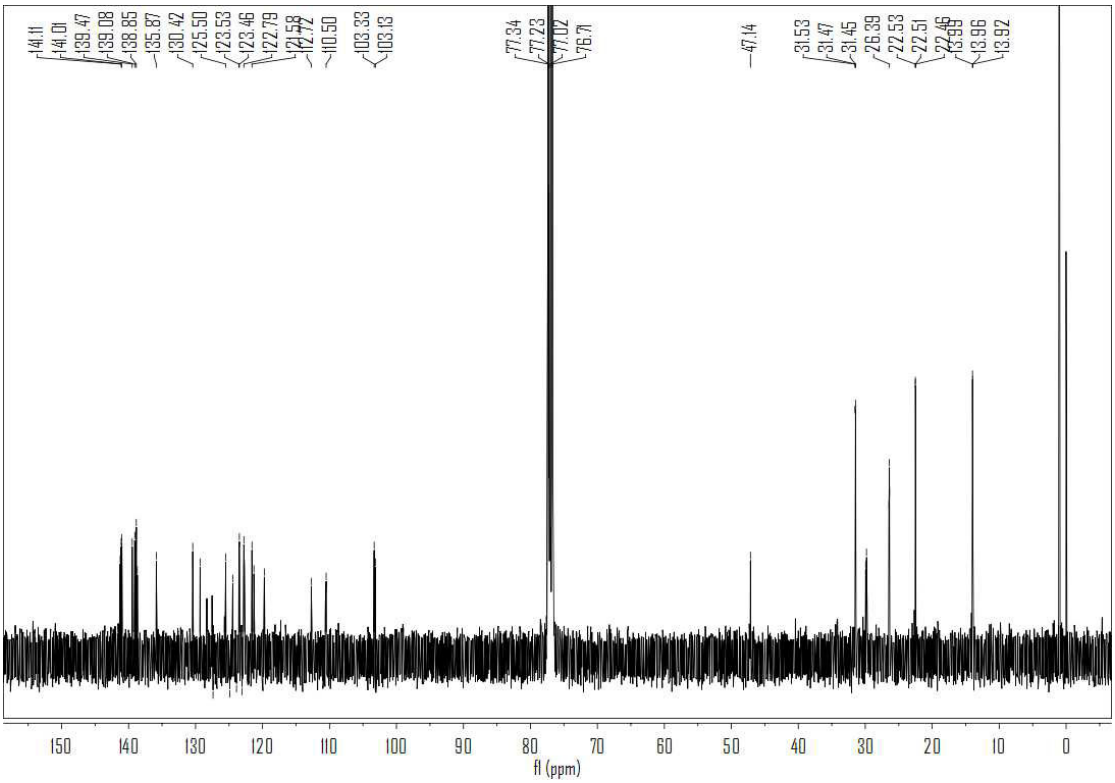


Figure S14.[13]C NMR spectrum of **Py-2TAT**.

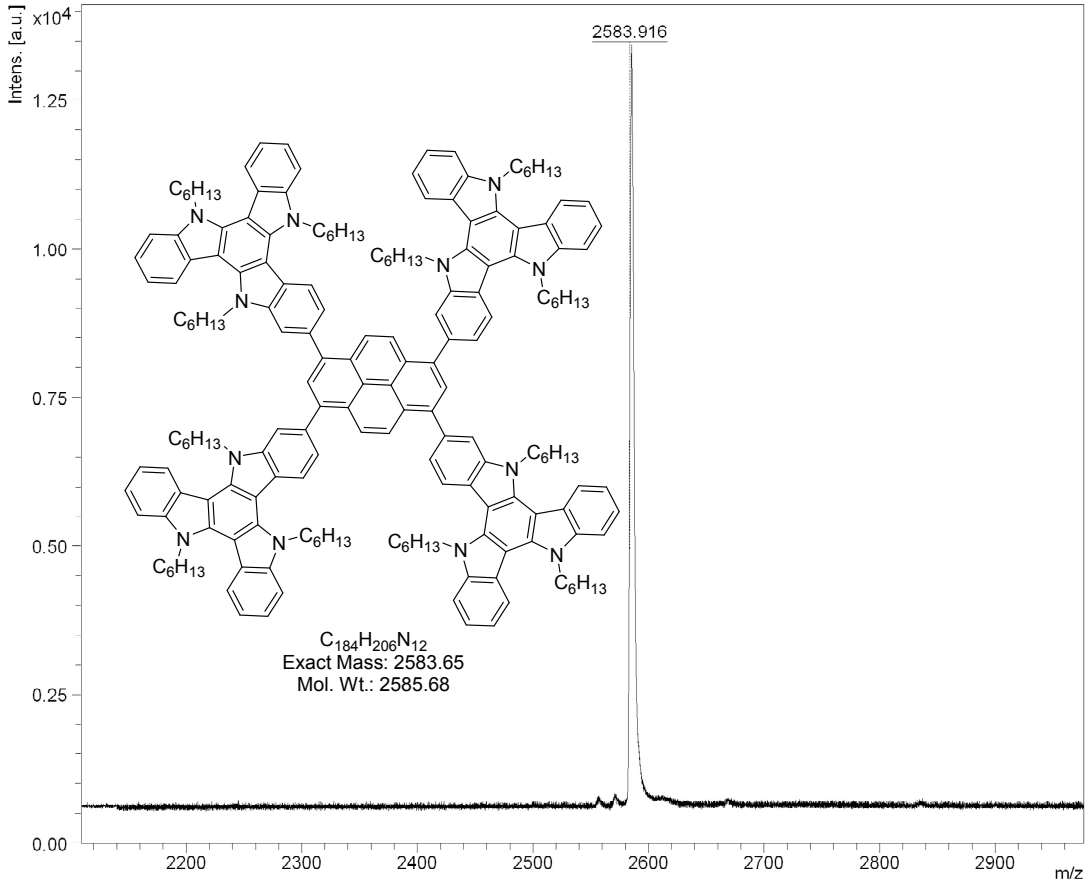


Figure S15. MALDI-TOF mass spectrum of **Py-4TAT**.

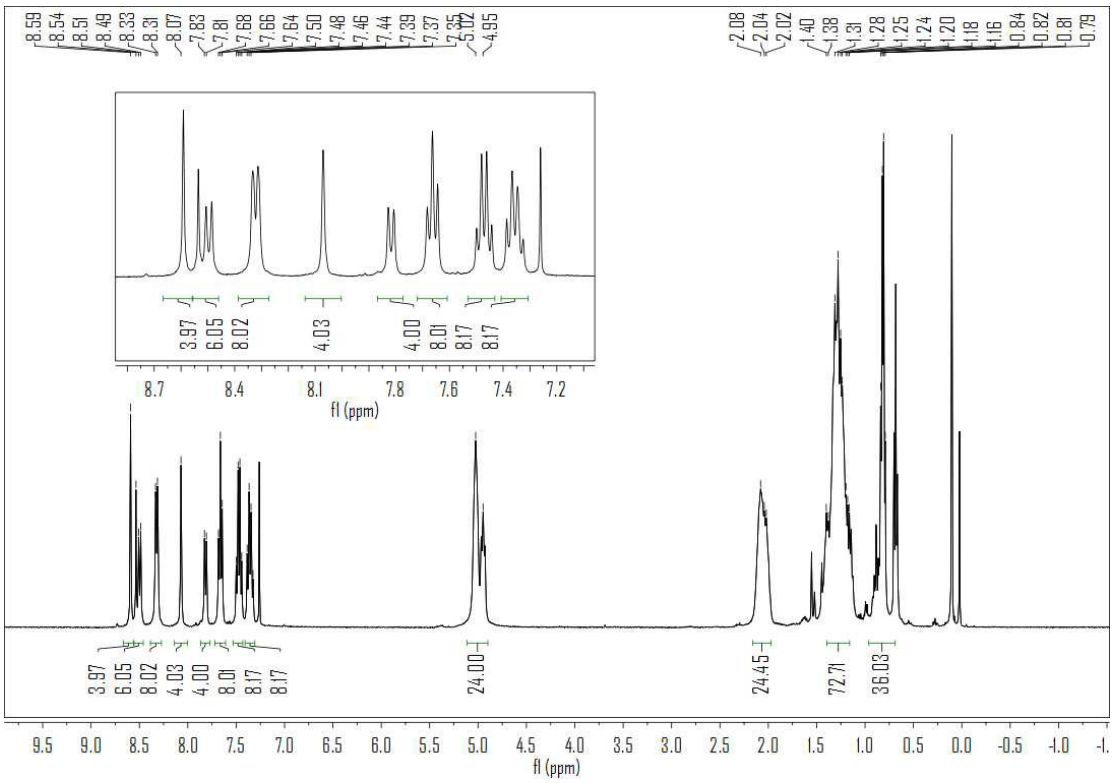


Figure S16. ^{1}H NMR spectrum of **Py-4TAT**.

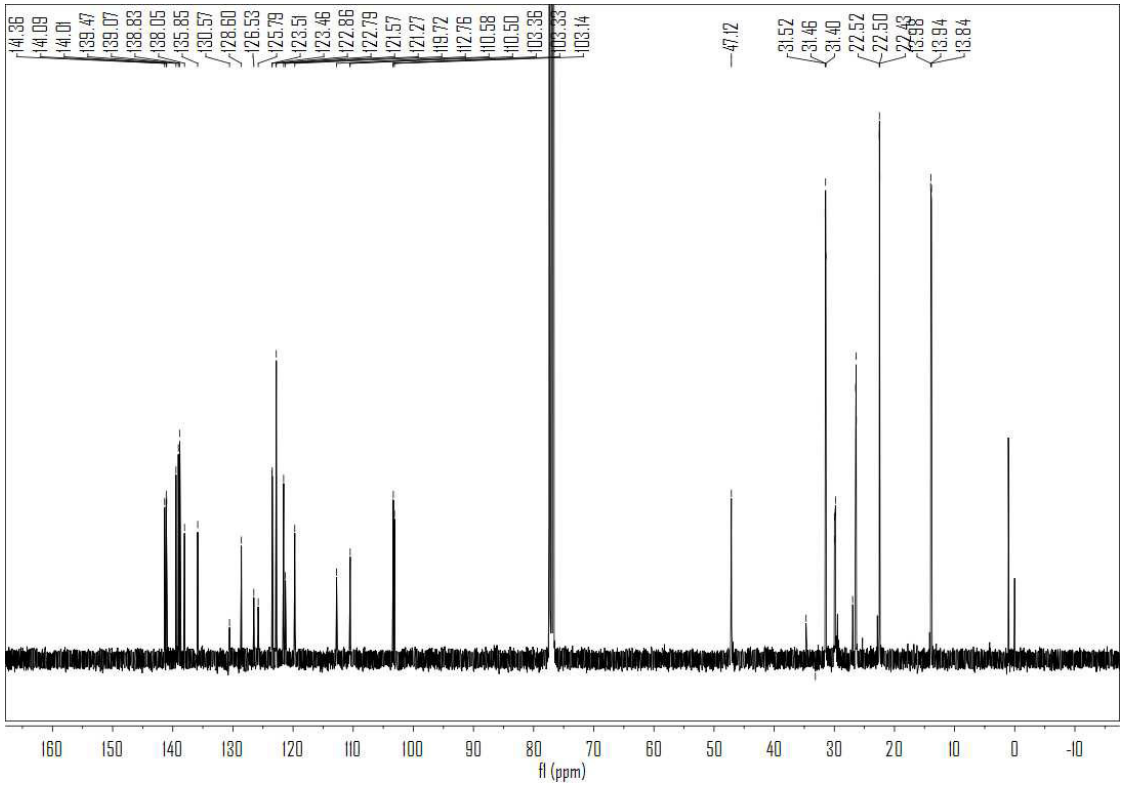


Figure S17. ^{13}C NMR spectrum of **Py-4TAT**.