Electronic Supplementary Information

Triazatriangulenium-based porous organic polymers for carbon dioxide capture

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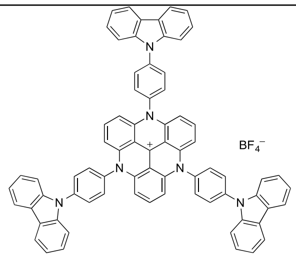
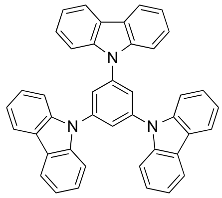
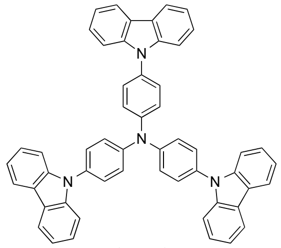
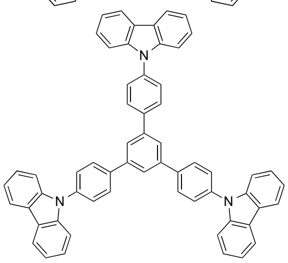
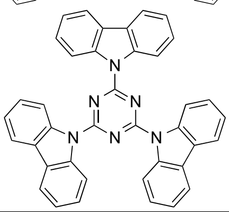
Table S1. Chemical composition (wt%) of TAPOPs determined by XPS analysis.

Polymer	C	N	O	S	B	F	Cl
TATA-1[a]	69.75	4.98	0	11.40	1.28	9.01	0
TAPOP-1	71.83	4.76	2.32	12.71	1.21	6.18	0.99
TATA-2[a]	80.22	7.69	0	0	0.99	6.95	0
TAPOP-2	81.22	8.09	0.93	0	0.96	7.54	1.26

[a] Theoretical value for TATA monomers.

Table S2. Textural property and CO_2 uptake of carbazole-based POPs with similar structure.

POPs	Monomer Structures	S_{BET} ($m^2\ g^{-1}$)	CO_2 Uptake (wt %)[a]	Q_{st} ($kJ\ mol^{-1}$)	Ref.
TAPOP-2		930	13.6	34.7	This work
CPOP-1		2220	21.2	27	S1
CPOP-5		1050	11.8	31.5	S2
CPOP-6		980	11.5	30	S2
MFCMP-1		840	16.2	30	S3

[a] at 273 K and 1.0 bar.

References:

S1 Q. Chen, M. Luo, P. Hammershøj, D. Zhou, Y. Han, B. W. Laursen, C.-G. Yan and B.-H. Han, Microporous polycarbazole with high specific surface area for gas storage and separation. *J. Am. Chem. Soc.,* 2012, **134** (14), 6084–6087.

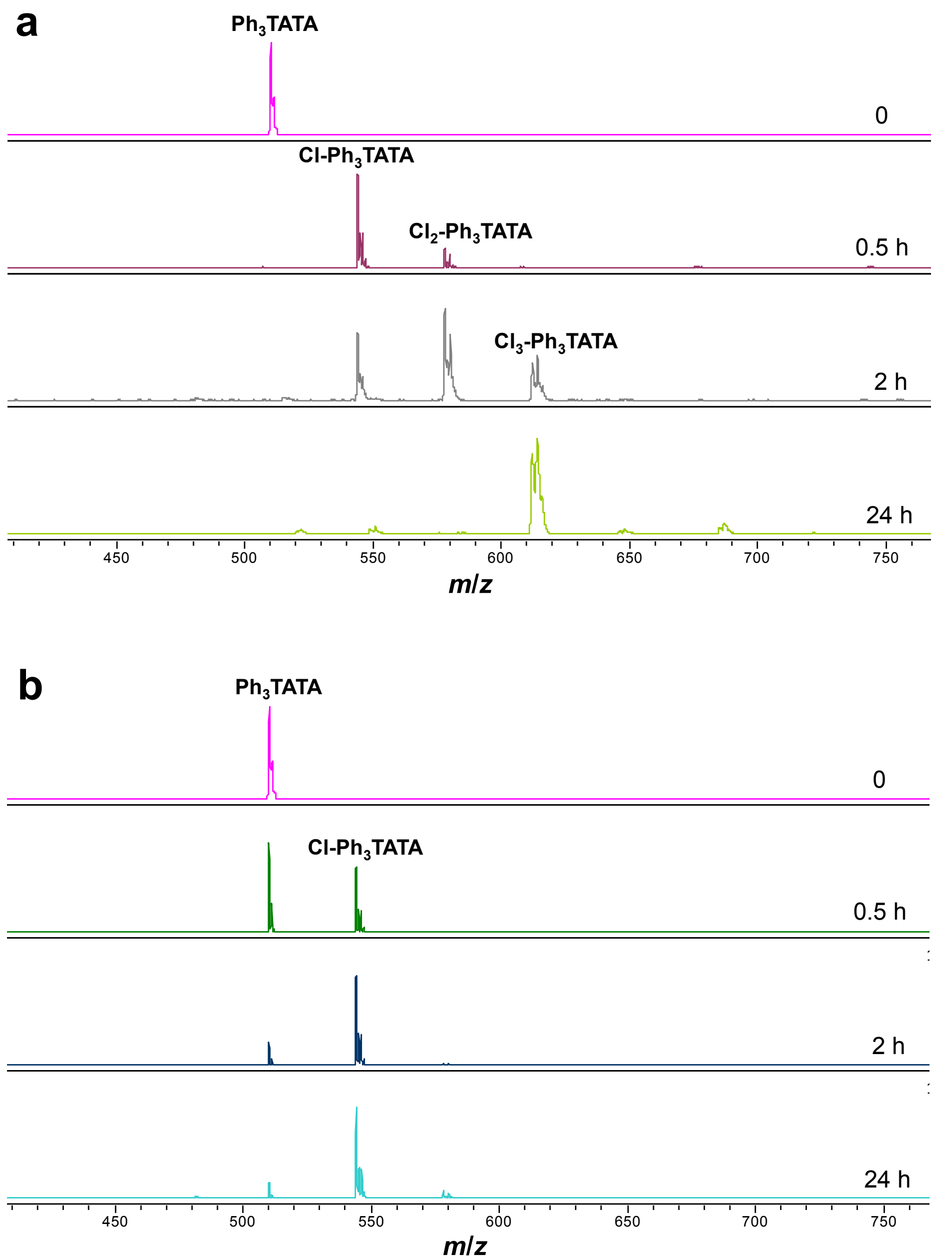


Figure S1. Mass spectra of the reaction mixtures of Ph_3TATA in $FeCl_3$-$CHCl_3$ (a) and $FeCl_3$-CH_2Cl_2-CF_3COOH (b) system after a certain time interval.

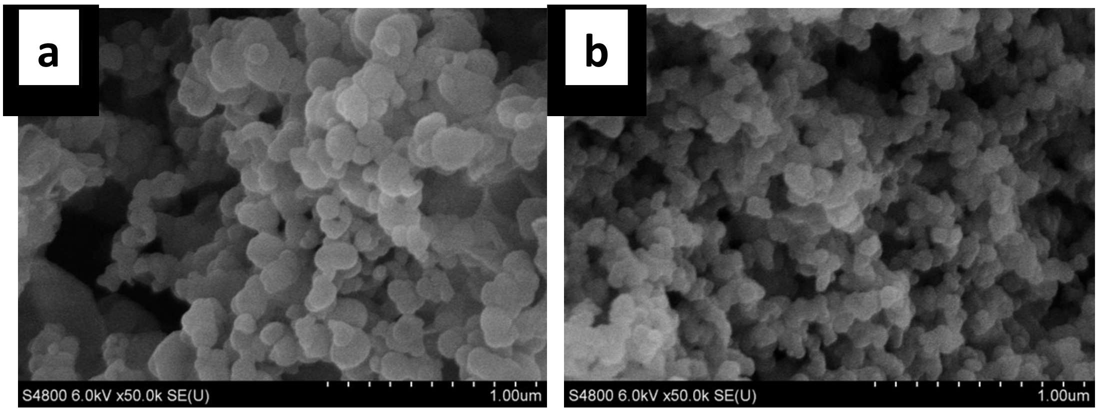


Figure S2. SEM images of (a) TAPOP-1 and (b) TAPOP-2.

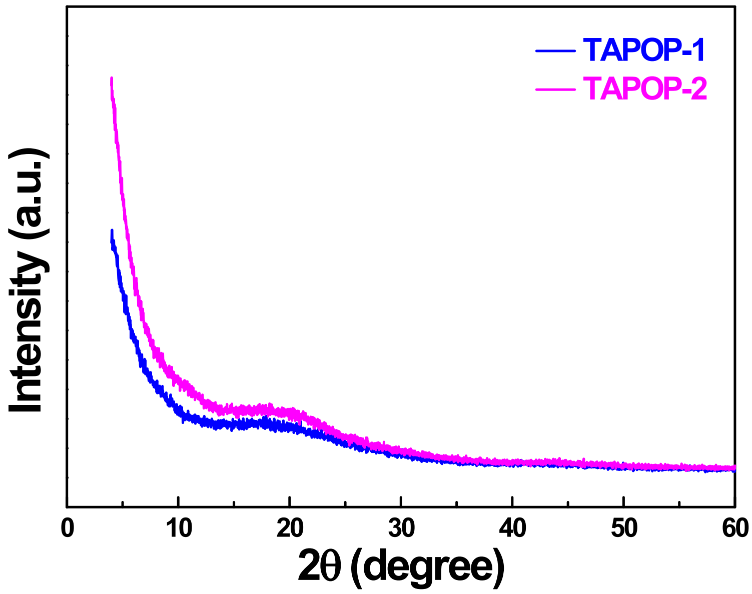


Figure S3. XRD patterns of TAPOPs.

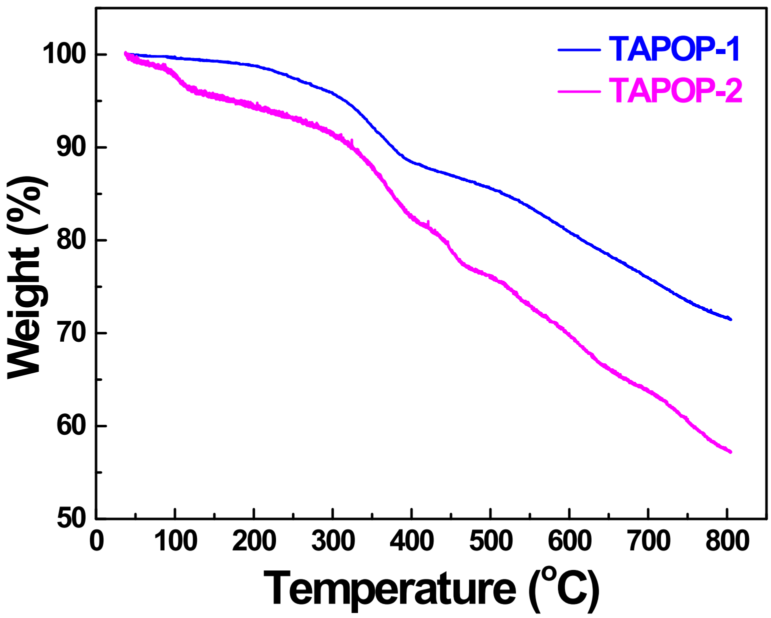


Figure S4. TGA curves of TAPOPs.

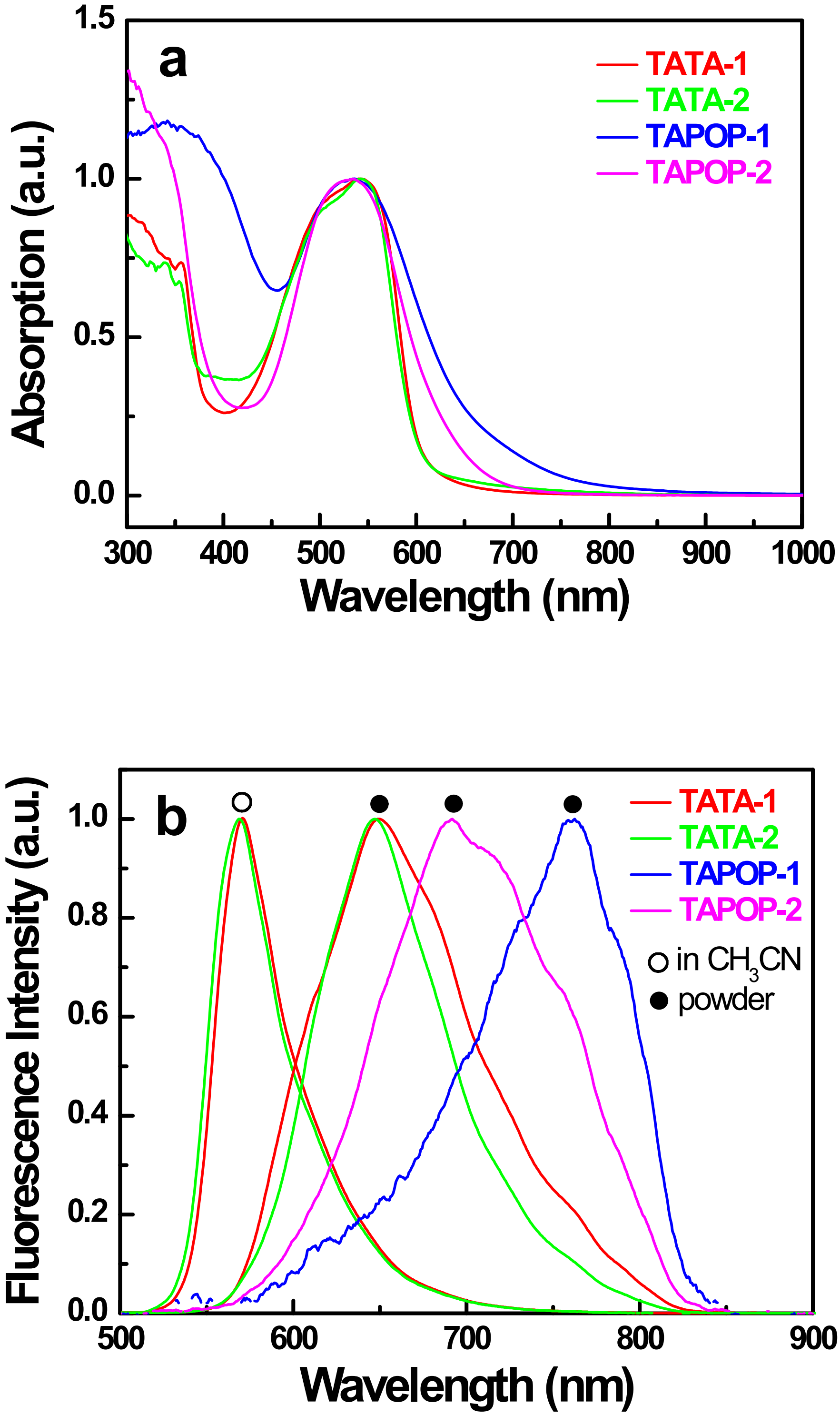


Figure S5. Normalized absorption (a) and emission (b) spectra of TATA monomers and TAPOPs.

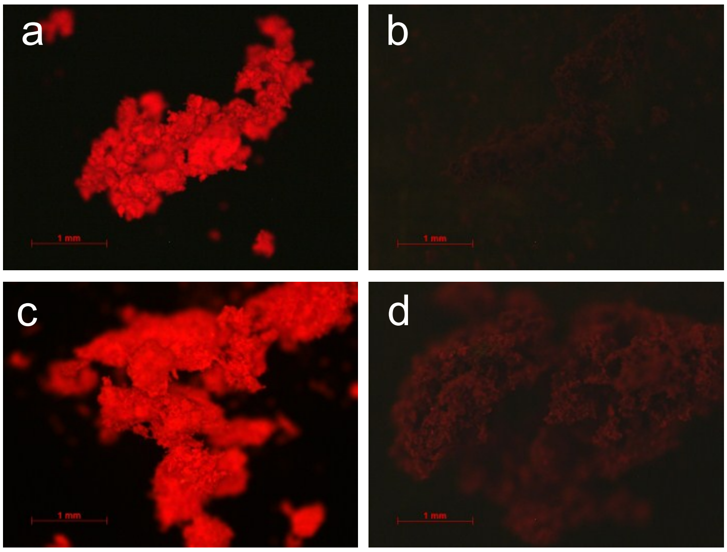


Figure S6. Emission images of the TATA monomers and TAPOPs. (a) TATA-1, (b) TAPOP-1, (c) TATA-2, (d) TAPOP-2.

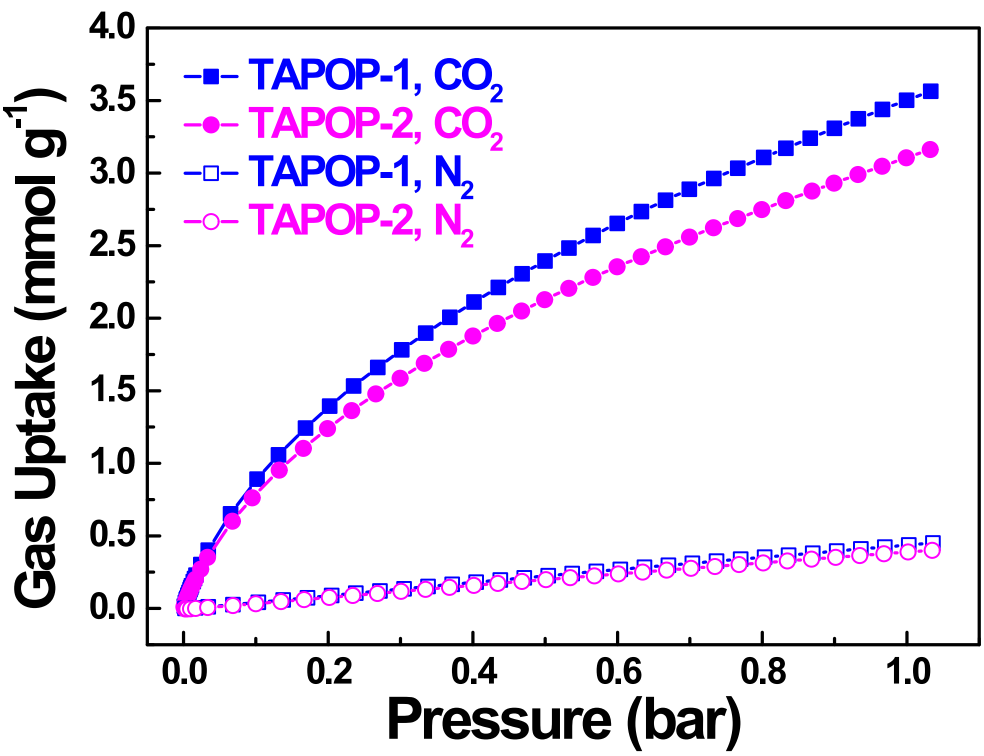
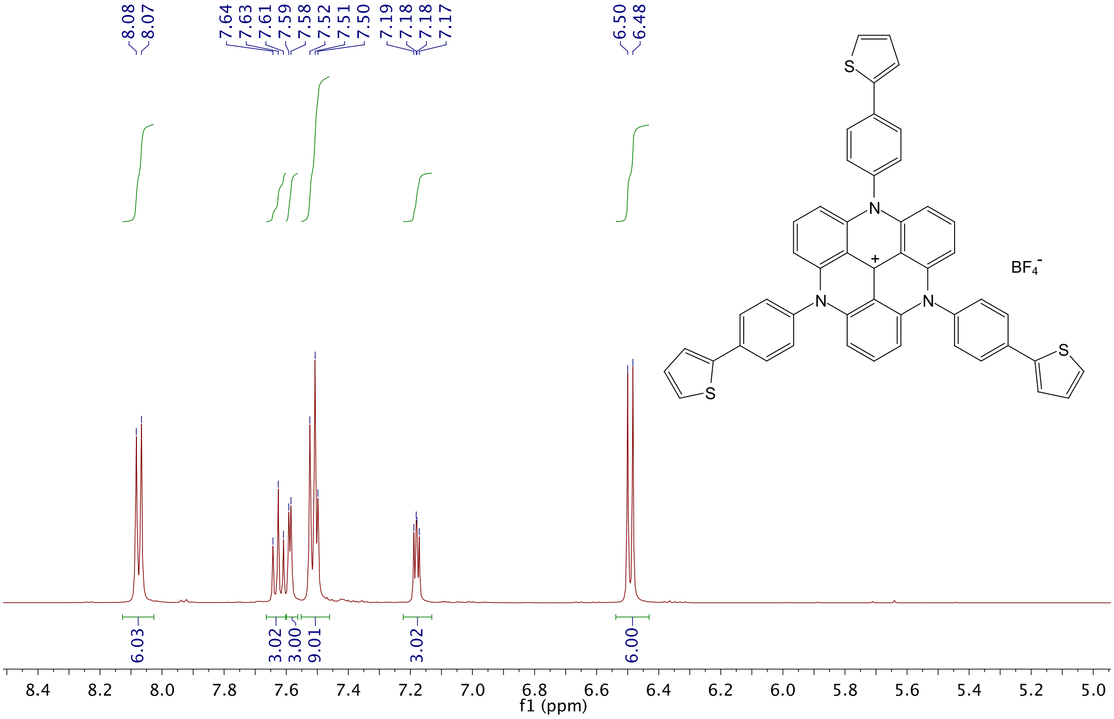
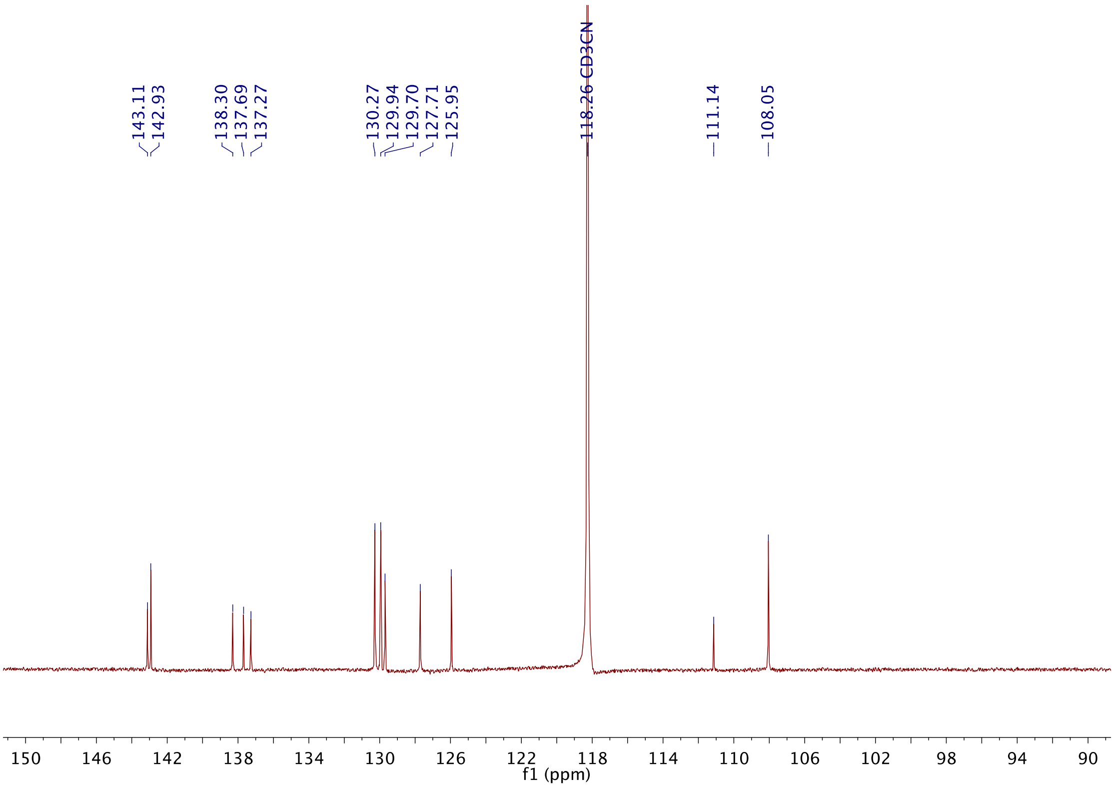


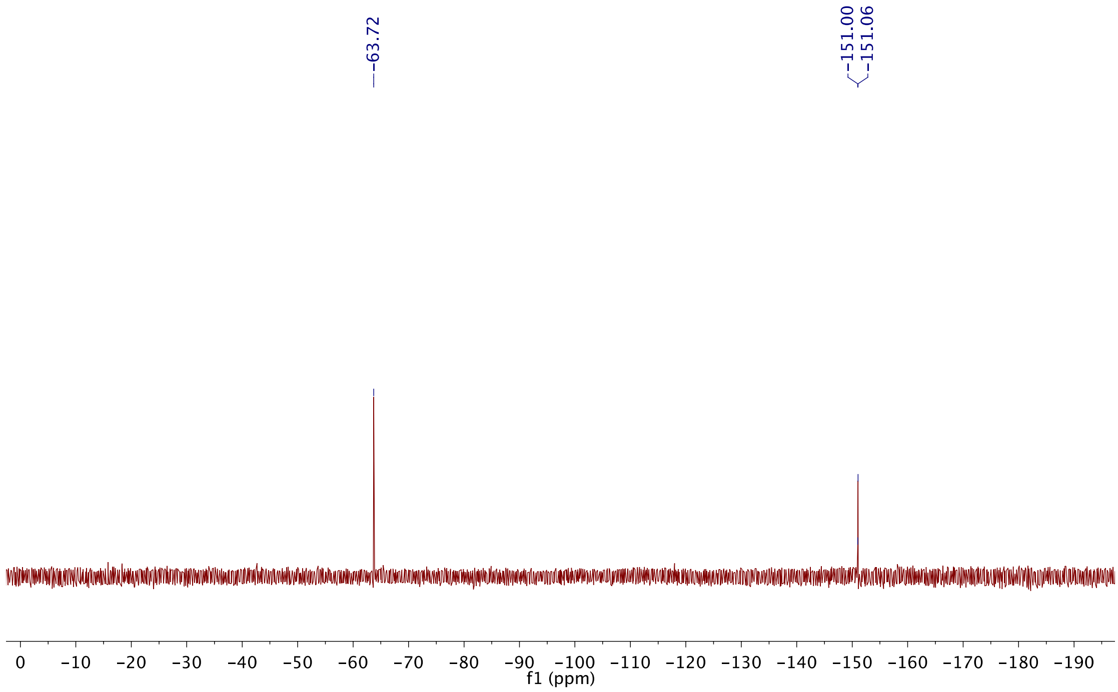
Figure S7. CO_2 and N_2 adsorption isotherms of TAPOPs at 273 K.



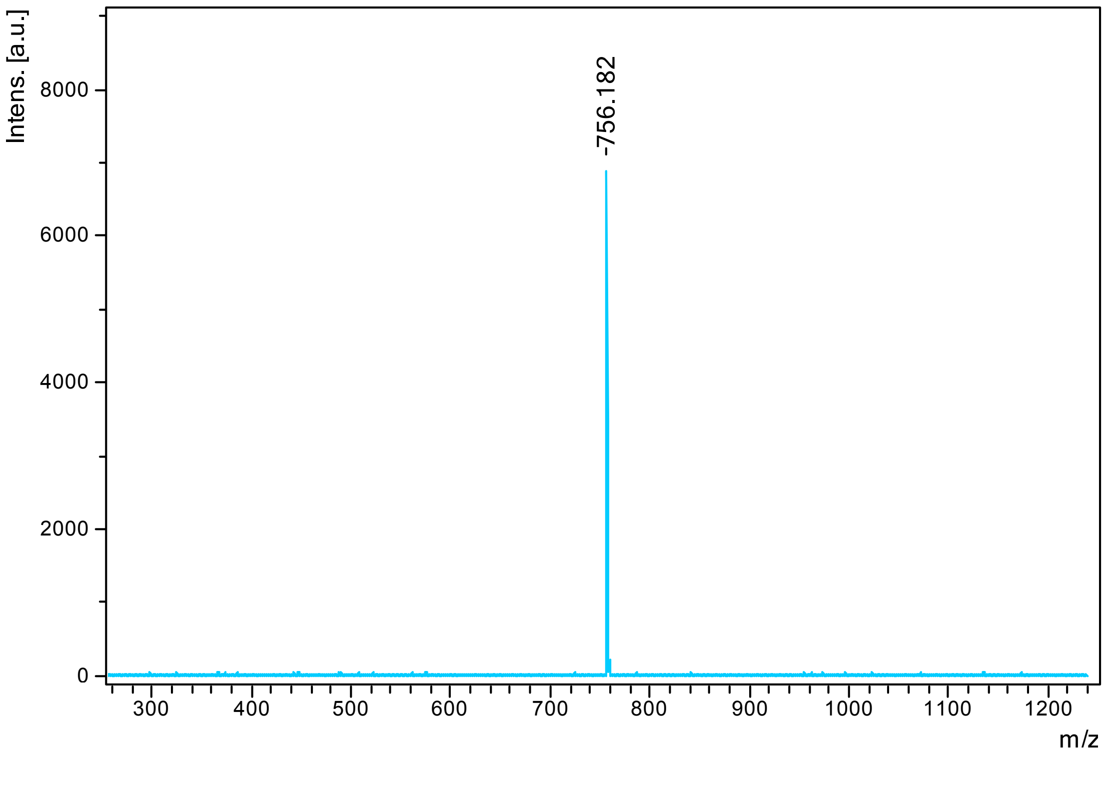
^{1}H NMR spectrum of TATA-1



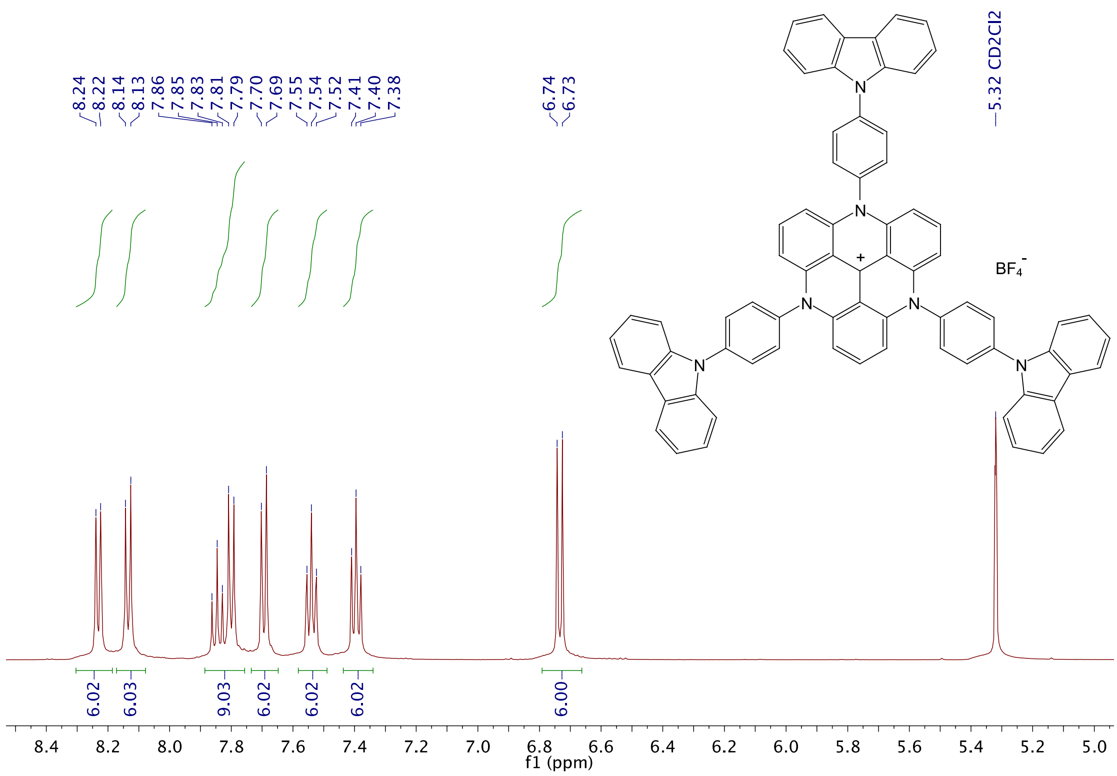
^{13}C NMR spectrum of TATA-1



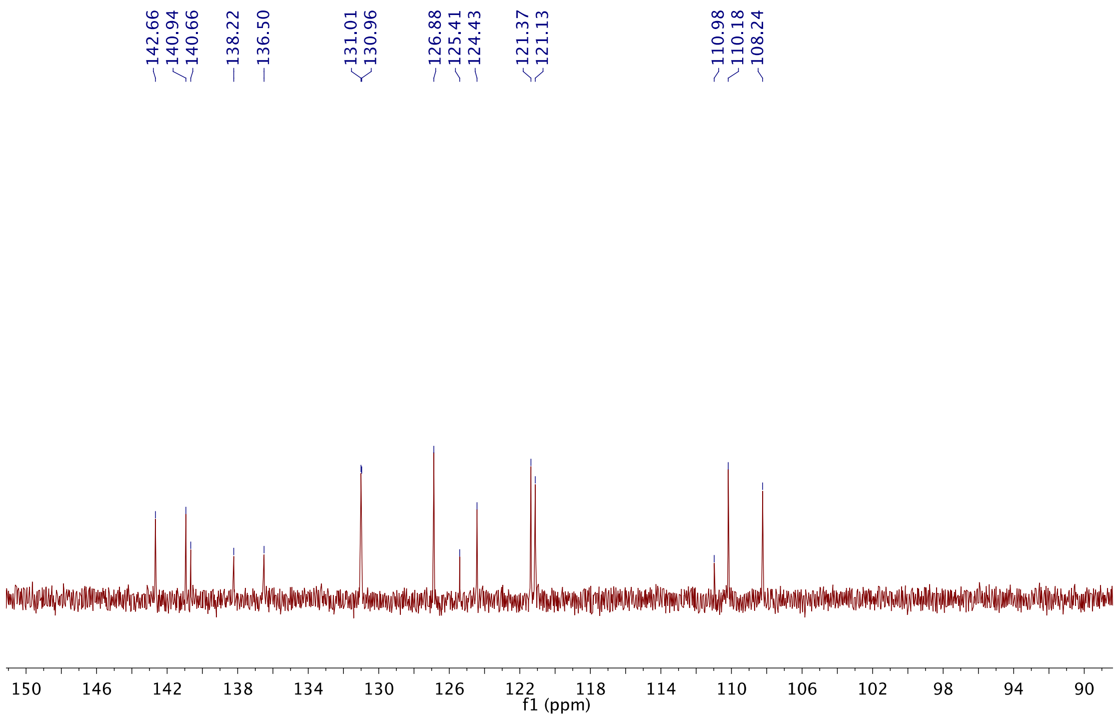
^{19}F NMR spectrum of TATA-1



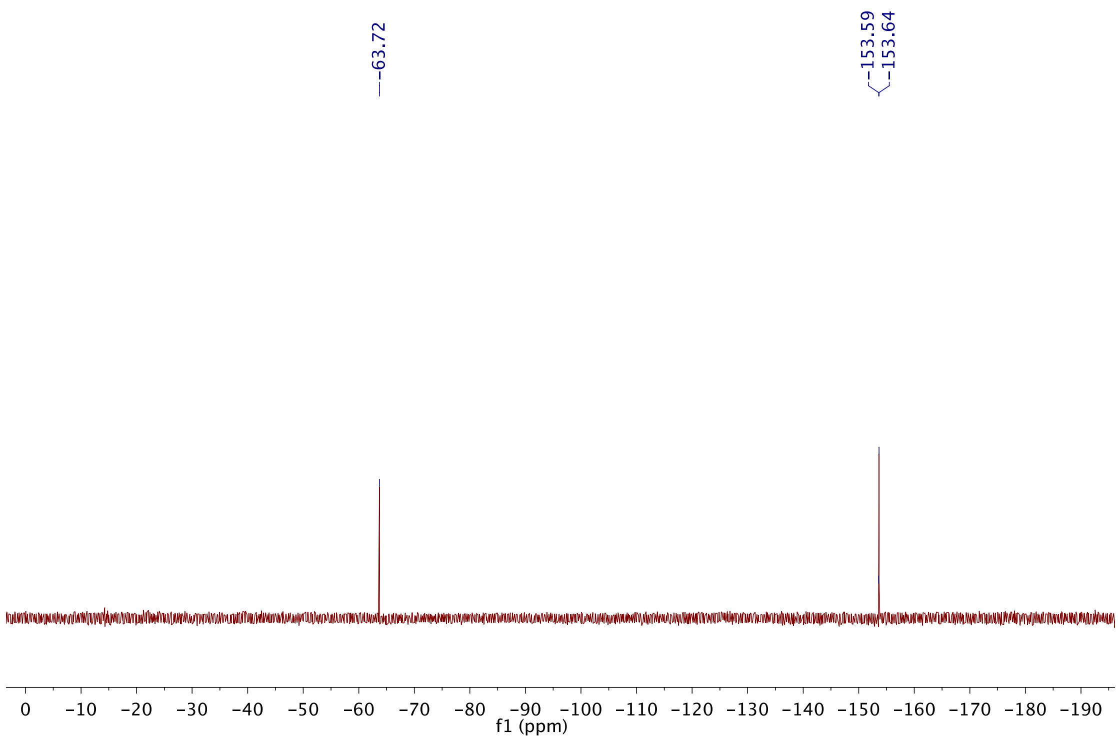
Mass spectrum of TATA-1



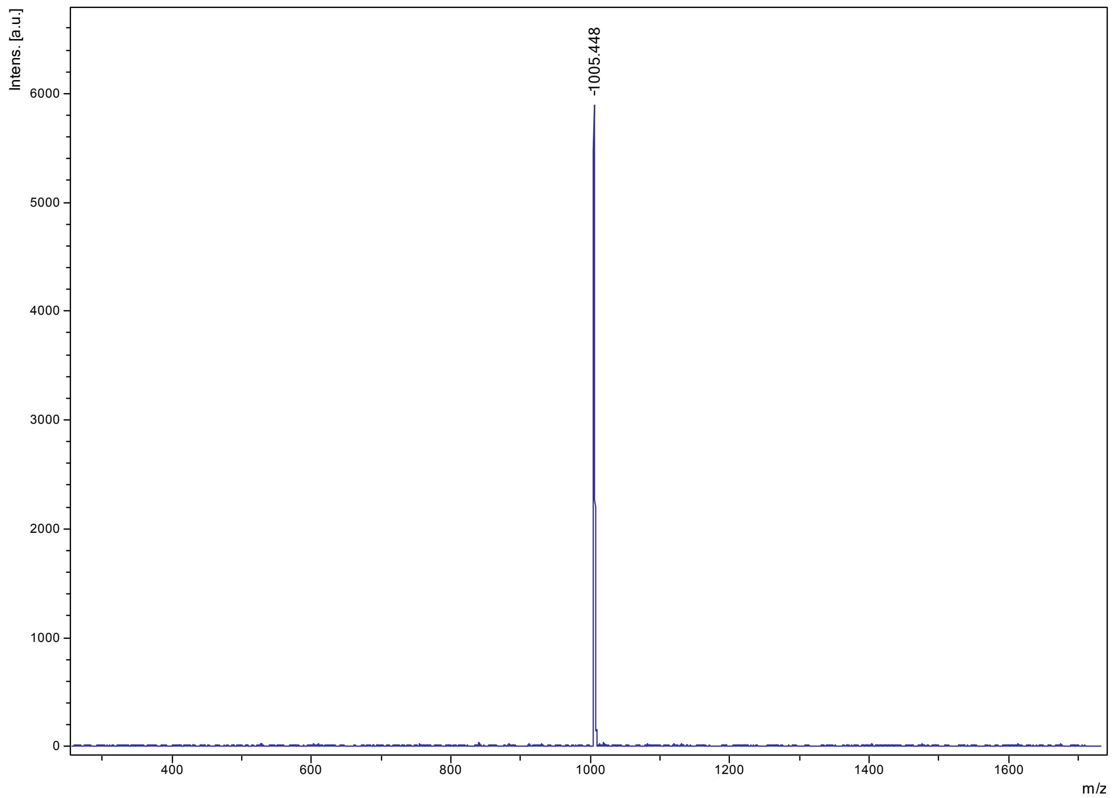
^{1}H NMR spectrum of TATA-2



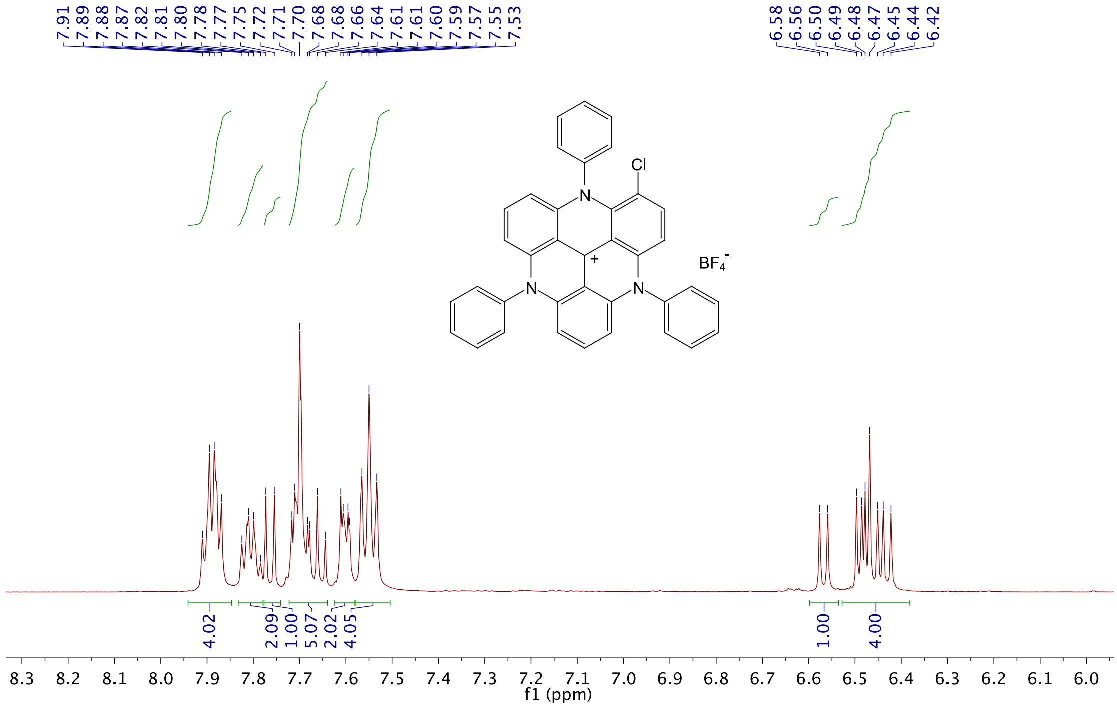
^{13}C NMR spectrum of TATA-2



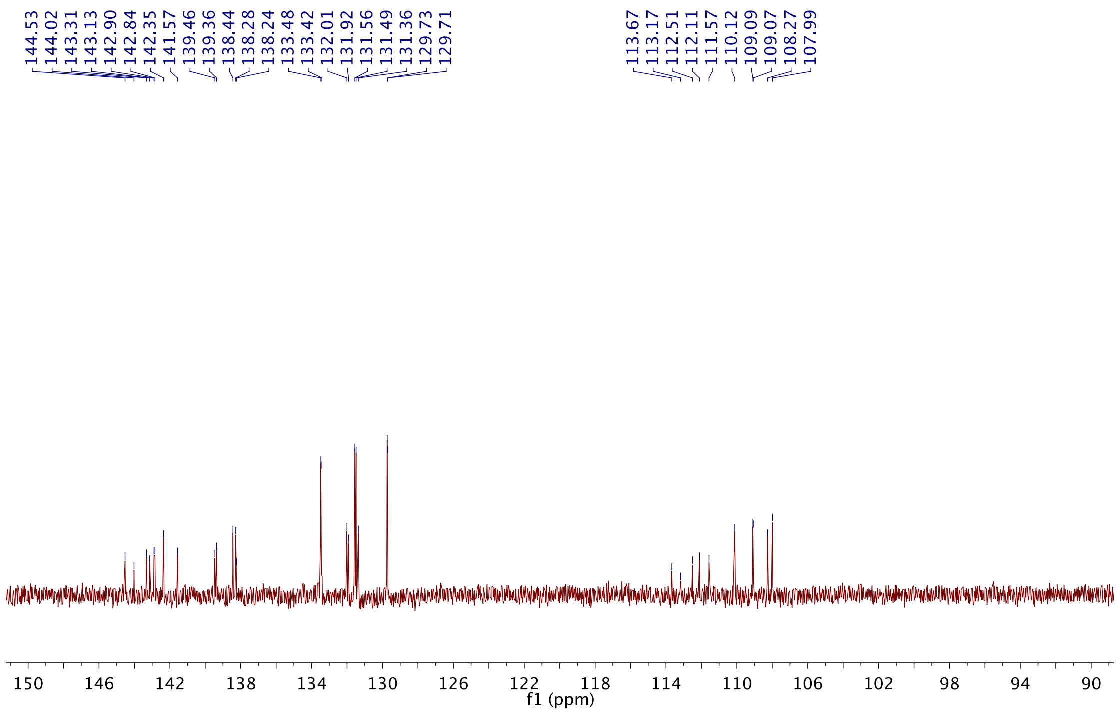
^{19}F NMR spectrum of TATA-2



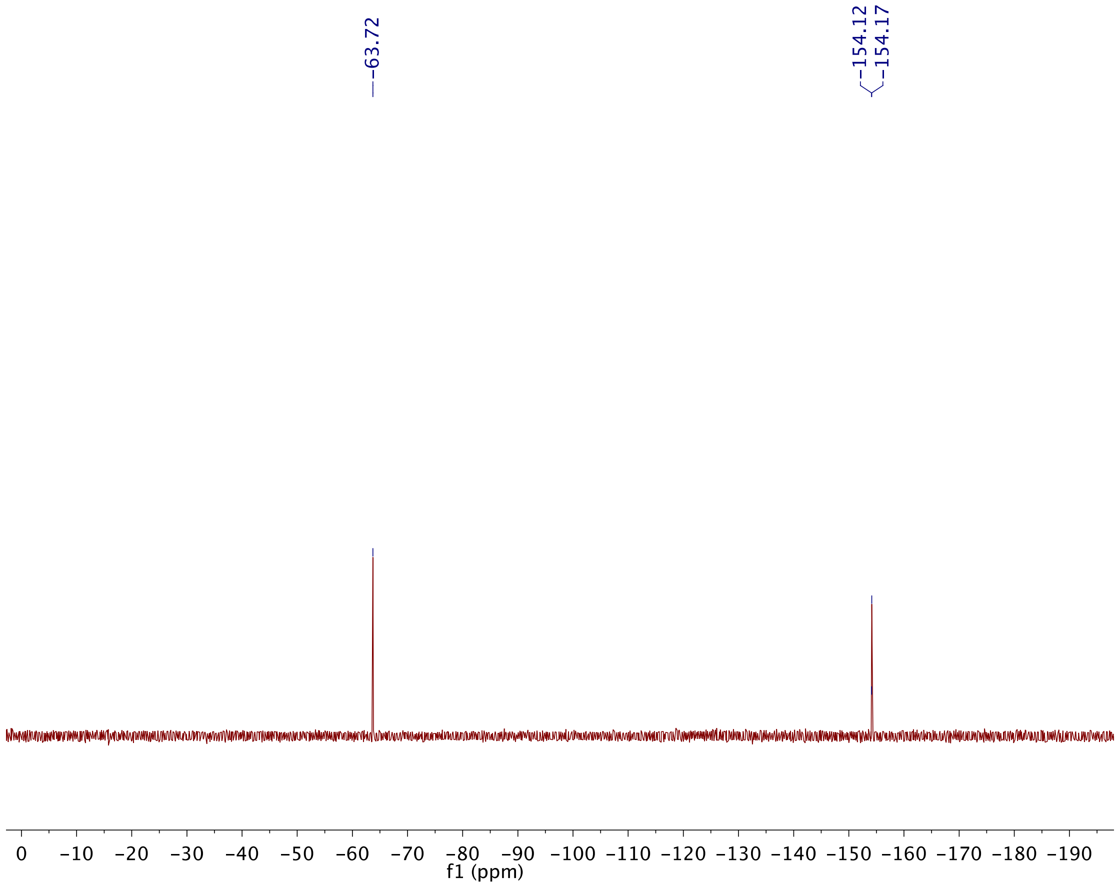
Mass spectra of TATA-2



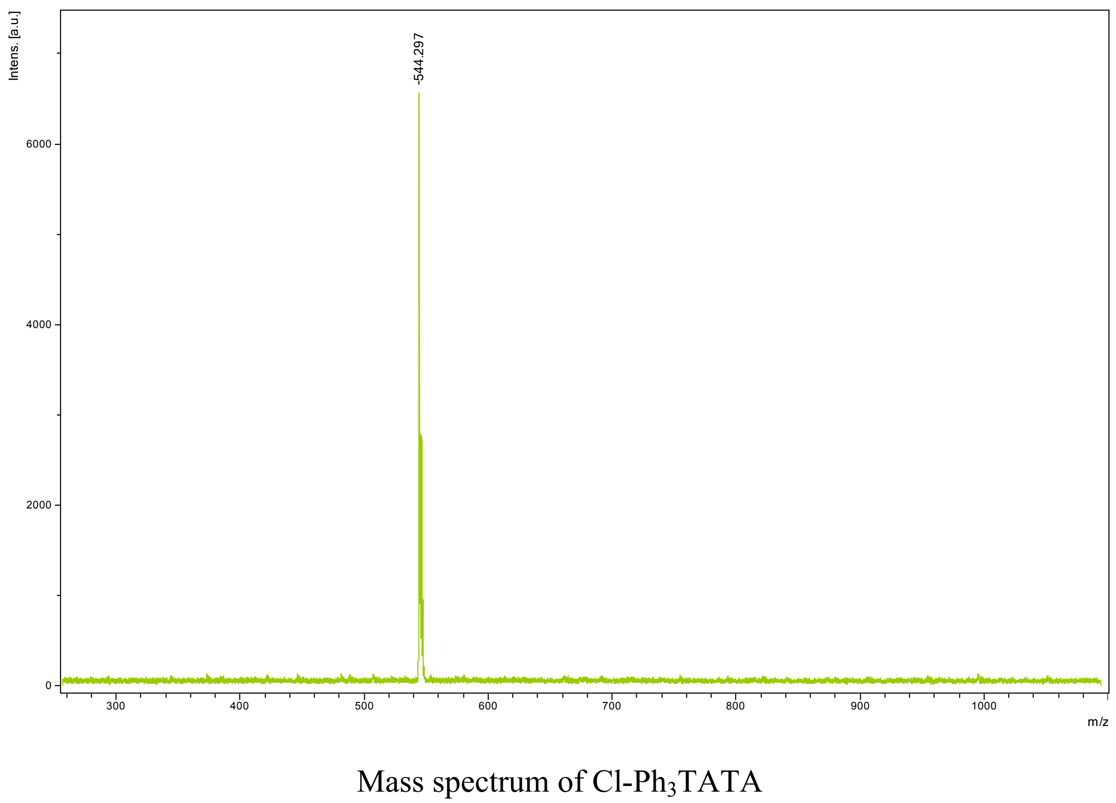
^{1}H NMR spectrum of Cl-Ph_3TATA



^{13}C NMR spectrum of Cl-Ph_3TATA



^{19}F NMR spectrum of Cl-Ph_3TATA



Mass spectrum of Cl-Ph_3TATA

S2 Q. Chen, D.-P. Liu, M. Luo, L.-J. Feng, Y.-C. Zhao and B.-H. Han, Nitrogen-containing microporous conjugated polymers via carbazole-based oxidative coupling polymerization: Preparation, porosity, and gas uptake. *Small,* 2014, **10** (2), 308−315.

S3 Y. Zhang, A. Sigen, Y. Zou, X. Luo, Z. Li, H. Xia, X. Liu and Y. Mu, Gas uptake, molecular sensing and organocatalytic performances of a multifunctional carbazole-based conjugated microporous polymer. *J. Mater. Chem. A,* 2014, **2** (33), 13422−13430.