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MDPI

Supporting Information

A Terpyridine-Fe^{2+}-Based Coordination Polymer Film for On-Chip Micro-Supercapacitor with AC Line-Filtering Performance

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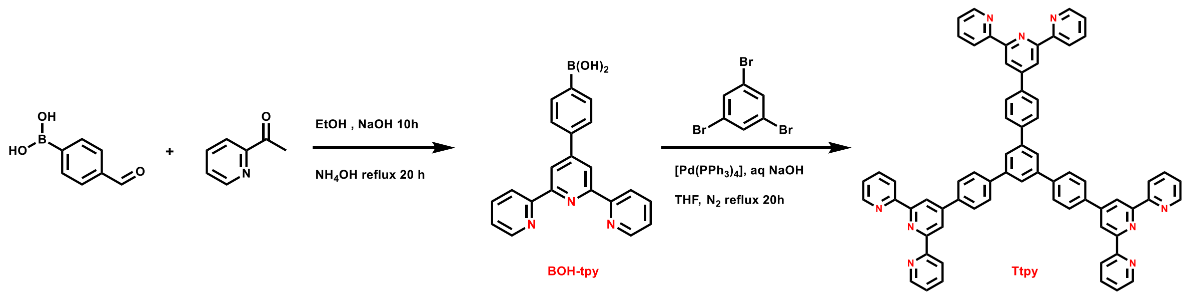


Scheme S1. Synthesis route to TpPB.

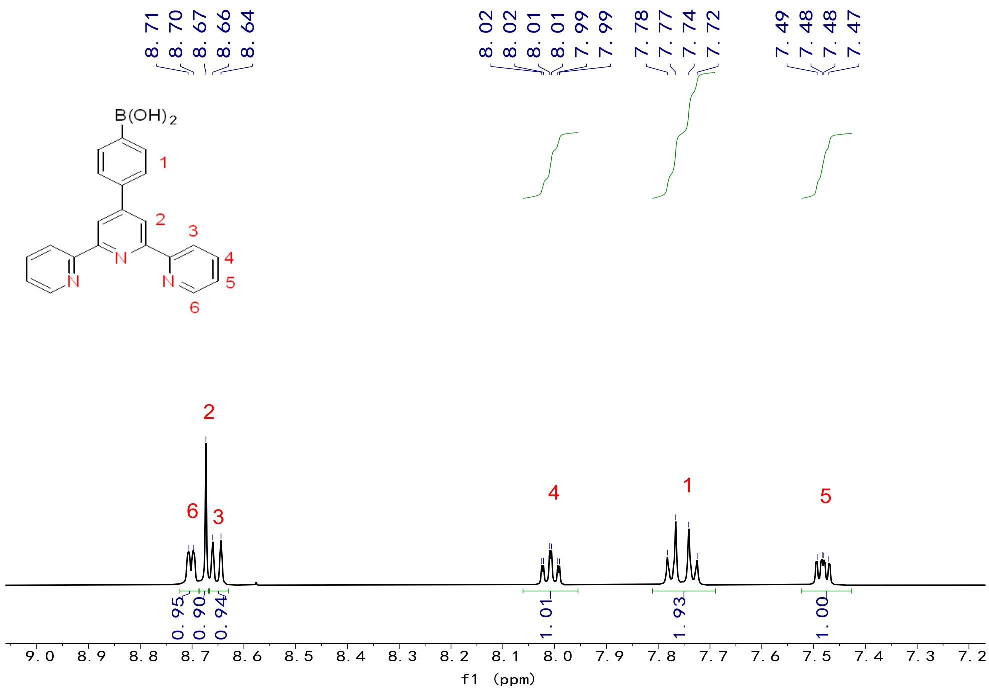


Figure S1. The ¹H NMR spectrum of 4′-(2,2′:6′,2′′-terpyridine)phenylboracic acid.

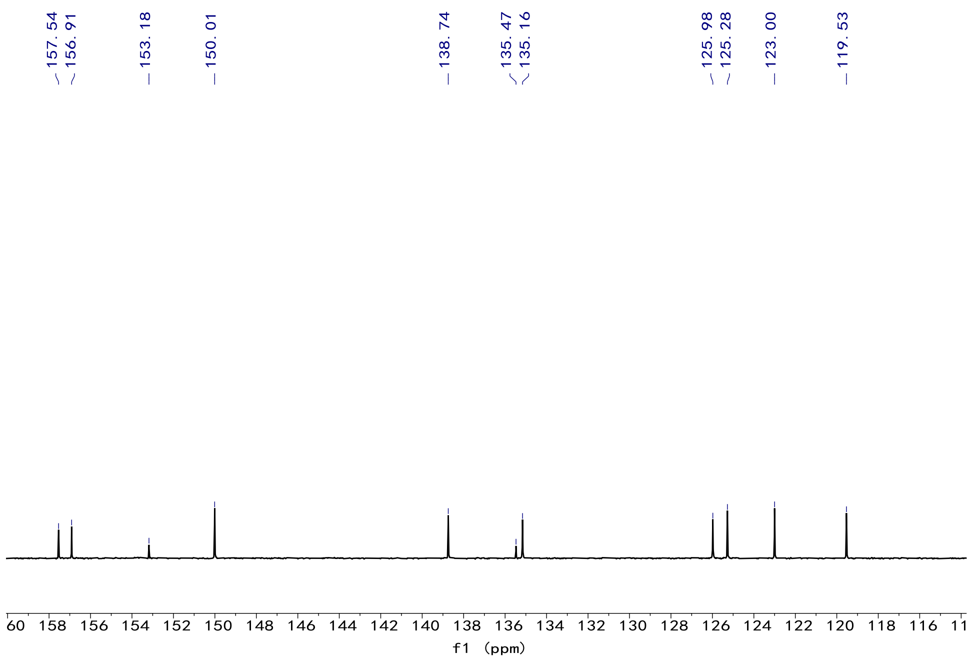


Figure S2. The ¹³C NMR spectrum of 4′-(2,2′:6′,2′′-terpyridine)phenylboracic acid.

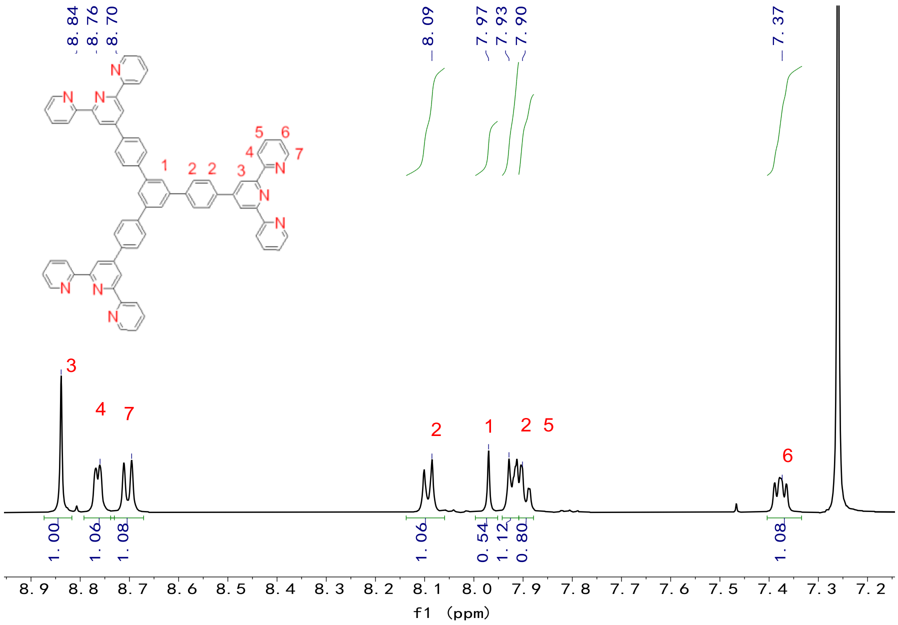


Figure S3. The [1]H NMR spectrum of 1,3,5-tri(4-(2,2′:6′,2″-terpyridine)phenyl) benzene.

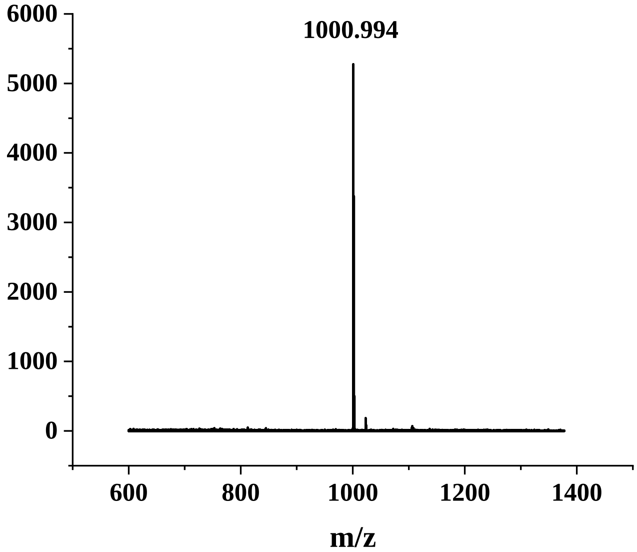


Figure S4. The MALDI-TOF of 1,3,5-tri(4-(2,2′:6′,2″-terpyridine)phenyl)benzene.

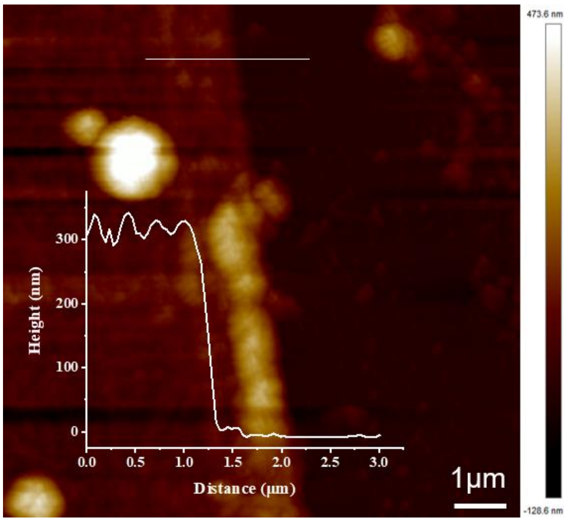


Figure S5. AFM image of **TpPB-Fe** film.

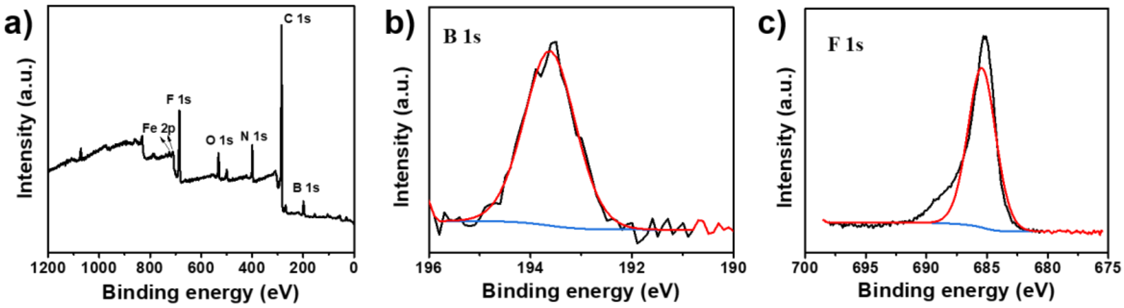
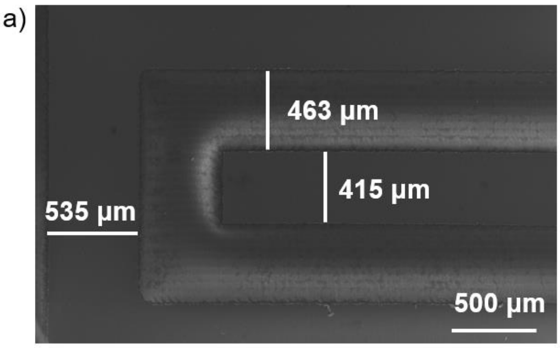


Figure S6. a) XPS survey spectrum, **b**) B 1s XPS spectrum, **c**) F 1s XPS spectrum of TpPB-Fe.



b)

Interdigital Finger Number, N	12
Finger Width, μm	415
Finger Length, mm	7
Interspatial Distance, μm	463
Edge Breath, μm	535
Effective Area, cm^2	0.45

$$0.415*7*12+0.535*(0.415+0.463)*10+0.415)*2=44.698\ mm^2$$

Figure S7. The parameters of the prepared Au interdigitated electrodes.

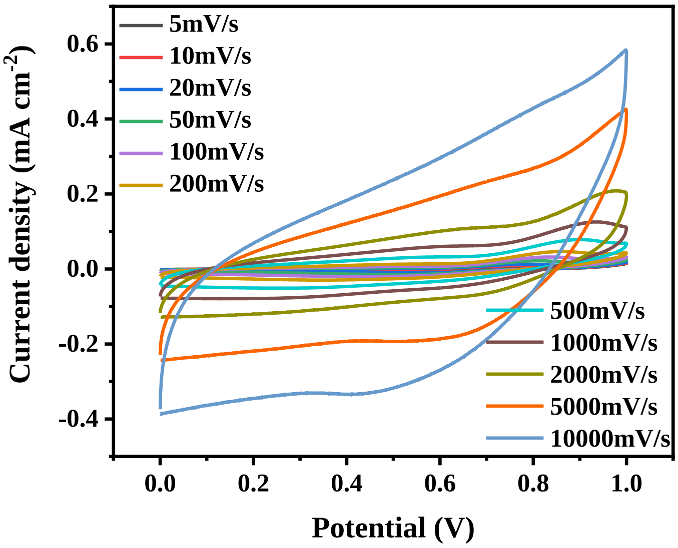


Figure S8. CV curves of TpPB-Fe-based MSC in PVA/LiCl gel electrolyte at different scan rates.

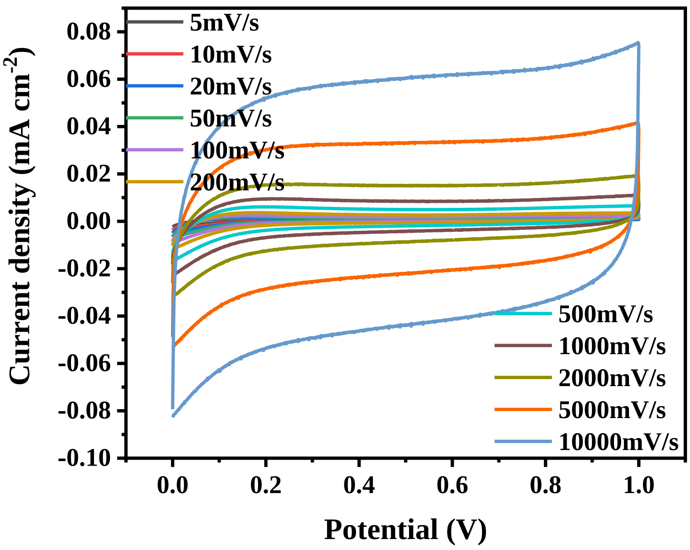


Figure S9. CV curves of TpPB-Fe-based MSC in PVA/H_2SO_4 gel electrolyte at different scan rates.

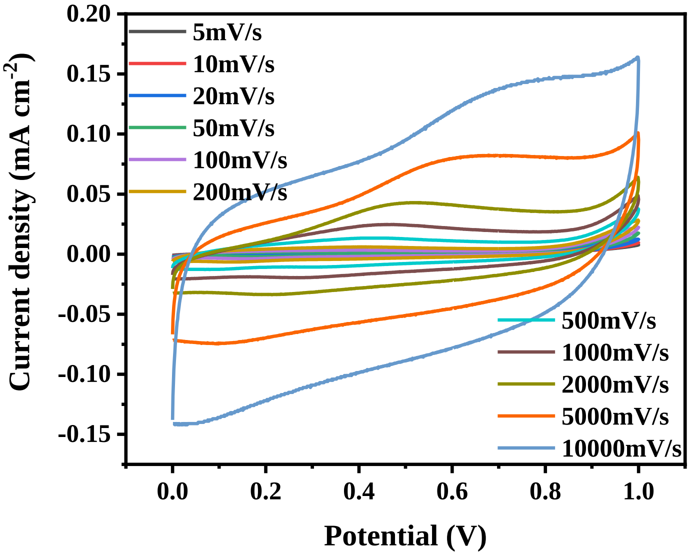


Figure S10. CV curves of TpPB-Fe-based MSC in [EMIM][BF_4] gel electrolyte at different scan rates.

Table S1. Band structure analysis of **TpPB-Fe**.

	UV-vis		CV		
	λ_{abs} (nm)	$E_{bg,\ optical}$ (eV)	E_{cb} (eV)	E_{vb}[a] (eV)	$E_{bg,\ CV}$ (eV)
TpPB-Fe	581	1.66	−3.56	-5.22	1.72

[a] the E_{vb} is calculated from the equation of $E_{bg,\ optical} = E_{cb} - E_{vb}$.

Table S2. The performance of MSCs based on different electrode materials.

Electrode materials	Thickness	electrolyte	Scan rate ($V\ s^{-1}$)	C_V ($F\ cm^{-3}$)	E_V ($mWh\ cm^{-3}$)	reference
TpPB-Fe	**300 nm**	**H_2SO_4/ LiCl**	**0.005**	**41.7**	**5.8**	***This work***
			0.05	**12.7**	**1.8**	
PiCBA	50 nm	H_2SO_4/ PVA	0.05	34.1	4.7	1
PANI nan-owires	10.1 μm	H_2SO_4/ PVA	0.3 mA cm^{-2}	105	3.9	2
Onion-like carbon	7.0 μm	$TEABF_4$/ PC	1	1.35	1.6	3
		Na_2SO_4 (1 M)	0.04	--	1	
CNT/RGO	6.0 μm	KCl (3 M)	0.01	3.1	0.68	4
CNT/ Graphene	20.0 μm	Na_2SO_4 (1 M)	1.0 A cm^{-3}	1.1	0.16	5
Graphene	15 nm	H_2SO_4/ PVA	0.01	17.9	2.5	6
RGO	--	--	0.02	3.1	0.43	7
graphene	5 μm	$EMIMNTF_2$	0.005	2	1.81	8

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