Supporting Information

High cycling stable supercapacitor through electrochemical deposition of metal-organic frameworks/polypyrrole positive electrode

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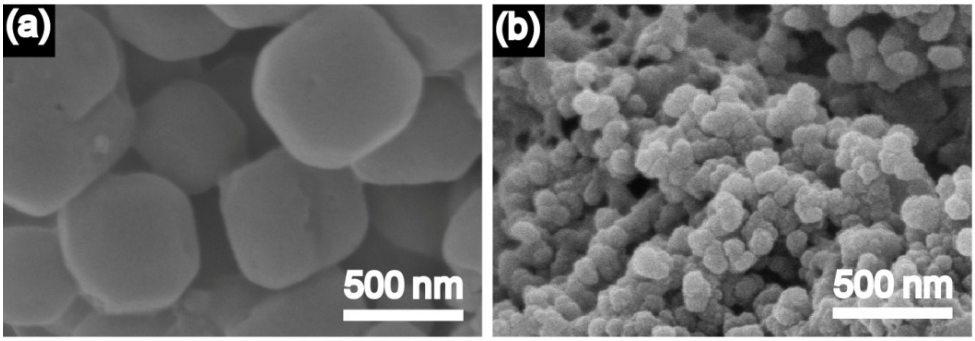

Fig. S1. SEM images of (a) the CC/ZIF-67 and (b) CC/ZIF-67/PPy electrode.

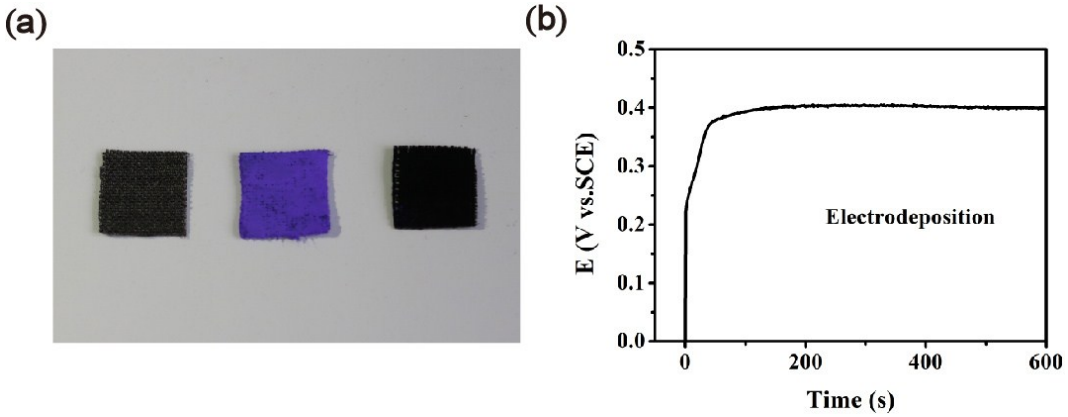

Fig. S2 (a) Colour of carbon cloth (CC), CC/ZIF-67 and CC/ZIF-67/PPy. (b) Chronopotentiometric curves during pyrrole polymerization.

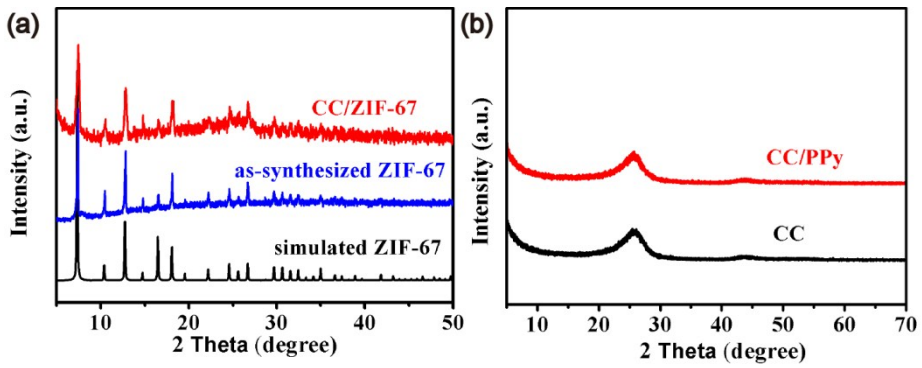

Fig. S3. XRD patterns of (a) the simulated ZIF-67, as-synthesized ZIF-67, CC/ZIF-67 and (b) CC and CC/PPy

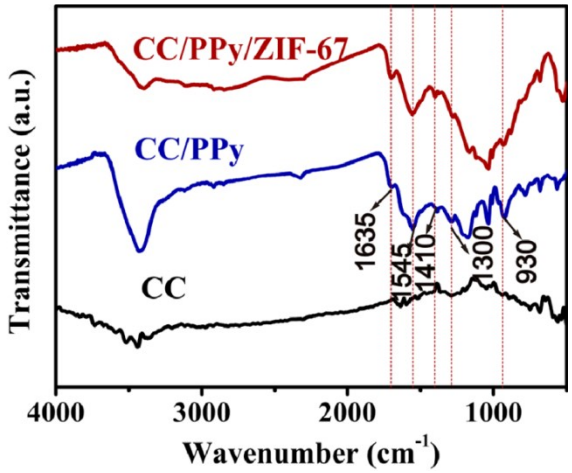

Fig. S4. FTIR spectrum of the CC, CC/PPy and CC/ZIF-67/PPy electrode.

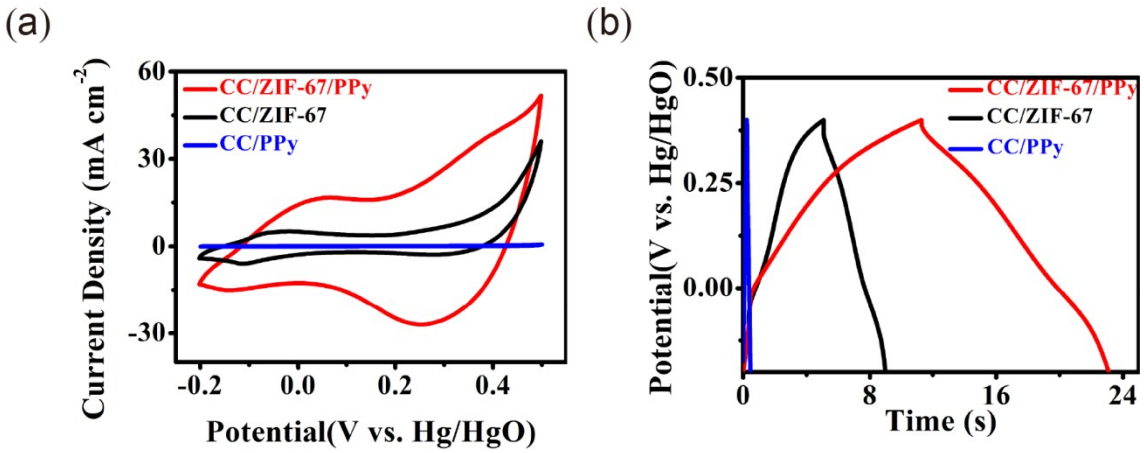

Fig. S5 (a) CV curves at 100 mV s^{-1} of CC/ZIF-67/PPy, CC/ZIF-67 and CC/PPy. (b) GCD curves at 20 mA cm^{-2} of CC/ZIF-67/PPy, CC/ZIF-67 and CC/PPy.

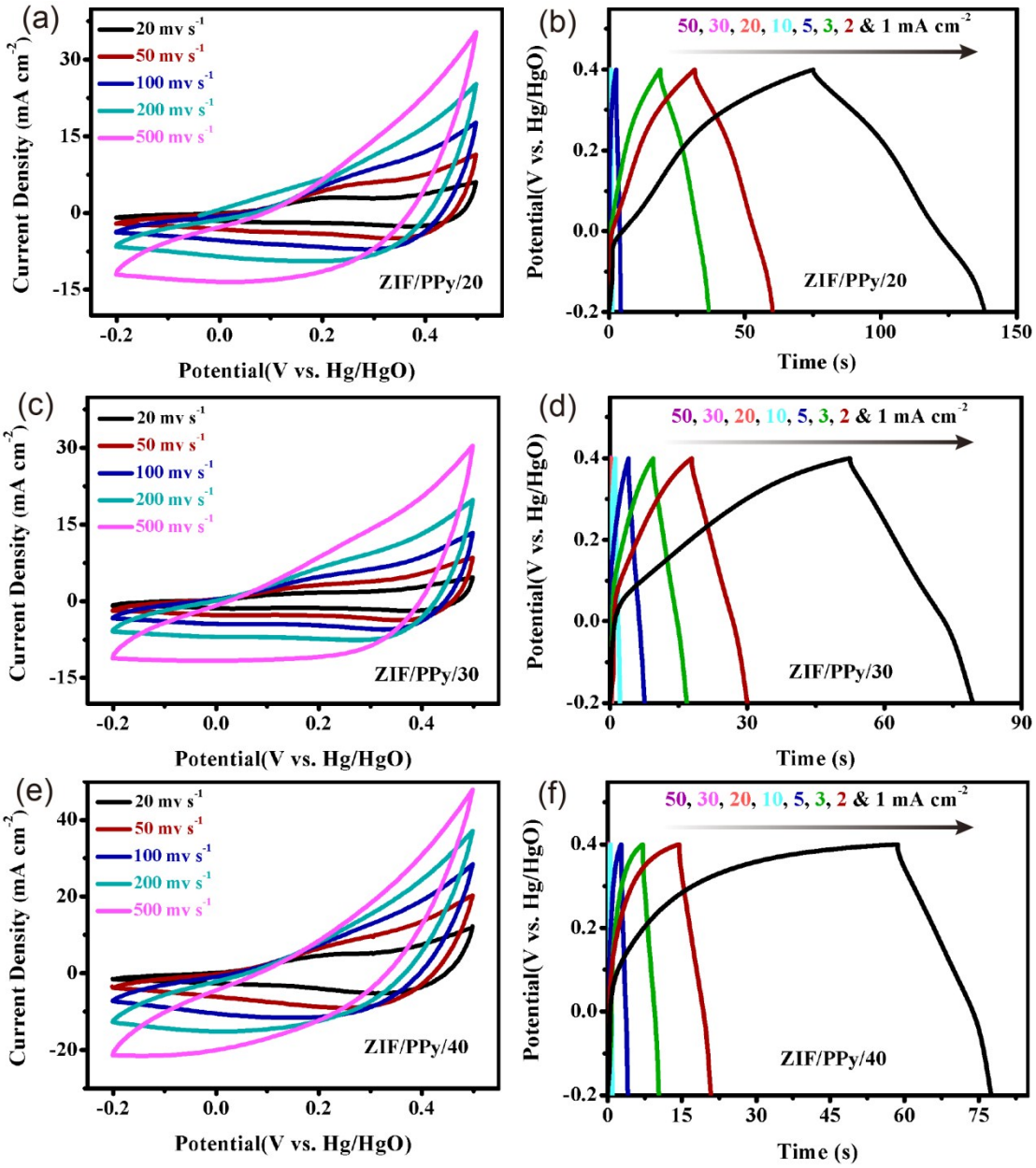

Fig. S6. CV curves of (a) ZIF/PPy/20 (c) ZIF/PPy/30 (e) ZIF/PPy/40 at different scan rate. GCD curves of (b) ZIF/PPy/20 (d) ZIF/PPy/30 (f) ZIF/PPy/40 at different current density.

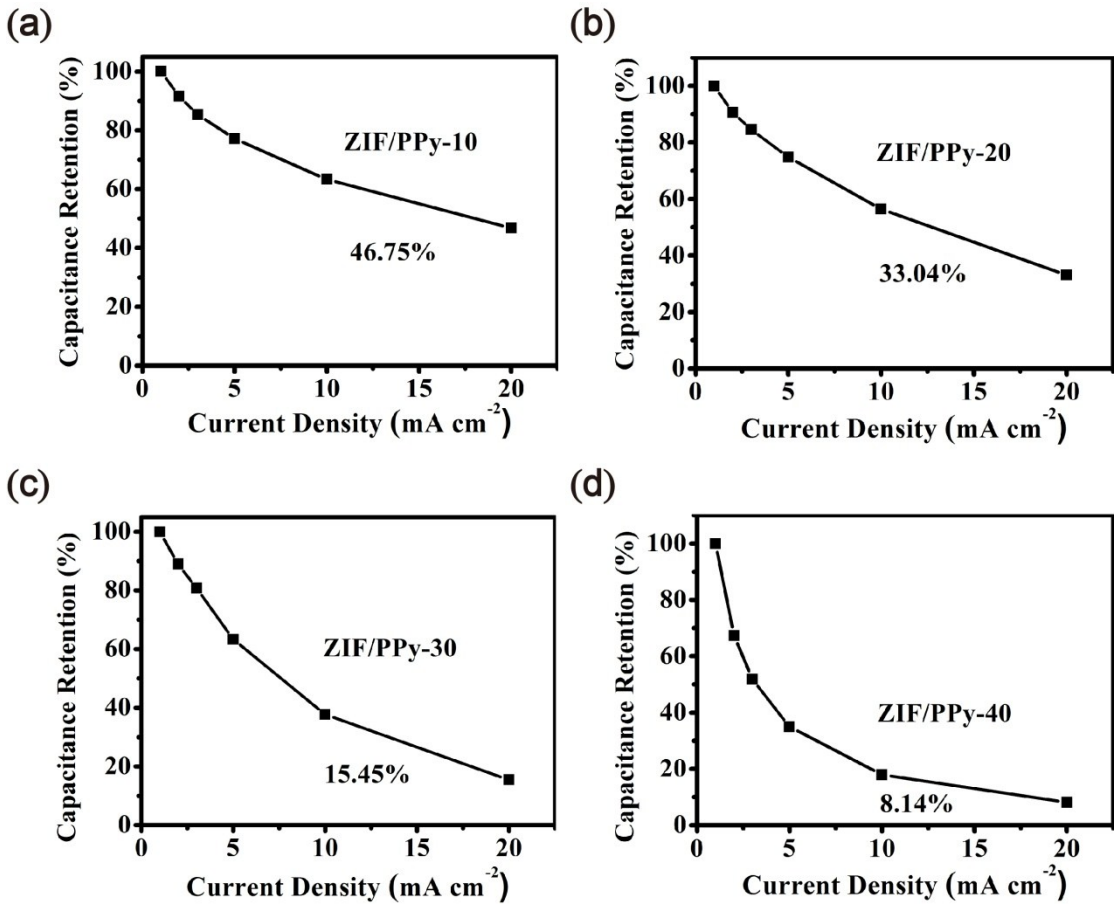

Fig. S7. Capacitance retention of (a) ZIF/PPy/10 (b) ZIF/PPy/20 (c) ZIF/PPy/30 (d) ZIF/PPy/40 with different current density from 1 to 20 mA cm^{-2}

Table S1. The mass loading of ZIF/PPy/10, ZIF/PPy/20, ZIF/PPy/30 and ZIF/PPy/40.

Type	ZIF/PPy/10	ZIF/PPy/20	ZIF/PPy/30	ZIF/PPy/40
Mass loading (mg)	0.45	0.55	0.63	0.70

Table S2. Comparison of capacitance between ZIF/PPy/10 and other MOF-based electrodes.

Type	Specific surface area ($m^2 g^{-1}$)	Electrolyte	Scan rate (current density)	Specific capacitance (F g^{-1})	Ref.
Ni-DMOF-ADC	783	2M KOH	1 A g^{-1}	552	1
Co-MOF	-	1M LiOH	0.6 A g^{-1}	207	2
Co8-MOF-5	2900	0.1M TBATF6	10 mA g^{-1}	0.3	3
Co-BPDC	138	0.5M LiOH	10 mV s^{-1}	179	4
$Ni_3(HITP)_2$	630	$TEABF_4$	50 mV s^{-1}	111	5

PANI-ZIF67-CC	73	3M KCl	10 mV s^{-1}	371 (35 mF cm^{-2})	6
PANI-CNT@ZIF-67-CC	1194	3M KCl	10 mV s^{-1}	0.58	7
ZIF-PPy-2	1168	1M Na_2SO_4	0.5 A g^{-1}	554	8
ZIF/PPy/10	-	6M KOH	1 mA cm^{-2}	284.9 (180.7 mF cm^{-2})	This work

Table S3. Comparison of cycling stability between ZIF/PPy/10 and other supercapacitor electrodes.

	Type	Electrolyte	Capacitance retention	cycles	Ref
MOFs-based supercapacitor electrode material	Ni-DMOF-ADC	2M KOH	98%	16000	1
	Co-MOF	1M LiOH	98.5%	1000	2
	$Ni_3(HITP)_2$	$TEABF_4$	90%	10000	5
	PANI-CNT@ZIF-67-CC	3M KCl	80%	2000	7
	ZIF-PPy-2	1M Na_2SO_4	90.7%	10000	8
	Zn/Ni-MOF@PPy	3M KOH	78.8%	5000	9
Carbon-based supercapacitor electrode material	F-GRF	6M KOH	109%	40000	10
	PTAC-6	6M KOH	100%	10000	11
	Mo-S2-rGo@PPyNTs	3M KCl	72%	10000	12
	a-SA/BC-700	6M KOH	93.8%	10000	13
Metal-based supercapacitor electrode material	NiO/C&S	3M KOH	115.9%	5000	14
	Co foam@CPNA	2M KOH	77.5%	20000	15
	Au-PEDOT|H3PO4/PVA|PEDOT-Au	1 M H_3PO_4	91.8%	20000	16
	ZIF/PPy/10	6M KOH	100.7%	40000	This work

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