

Application of chemically synthesized polypyrrole with hydro-sponge characteristic as electrode in water desalination

Jiangtao Feng^a, Qian Zhang^a, Jiajing Wang^a, Honghui Yang, Hao Xu^{a*}, Wei Yan^{a,b*}

a. Department of Environmental Science and Engineering, Xi'an Jiaotong University, Xi'an 710049, China

*b. The State Key Laboratory of Multiphase Flow in Power Engineering, Xi'an Jiaotong University, Xi'an, 710049,
China*

^{a*} Corresponding author

Email address: Xuhao@mail.xjtu.edu.cn (H Xu)

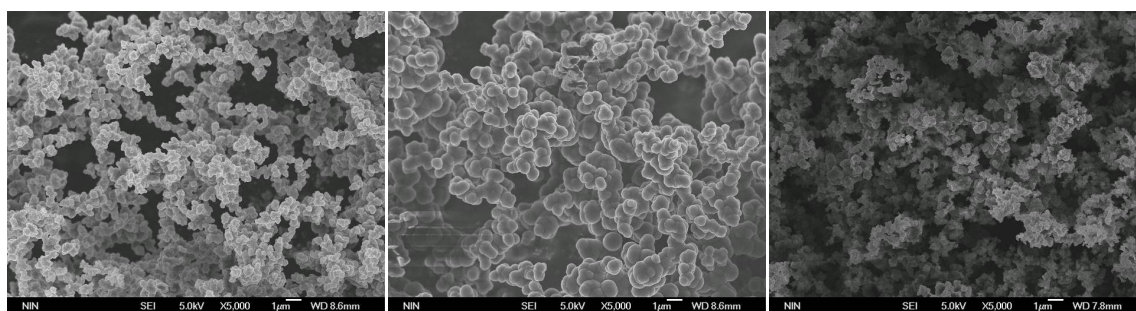
^{a,b*} Corresponding author

Tel: +86 029 82664731

Email address: yanwei@mail.xjtu.edu.cn (W Yan)

Table S1 Expansion ratio of PPy/A⁻ for 10 sopping up/dehydrate cycles

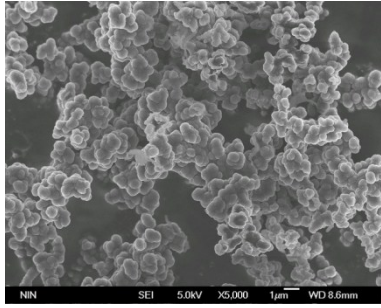
Time s	Py/pTS ⁻ (molar ratio)					Py/BS ⁻ (molar ratio)					Py/NO ₃ ⁻ (molar ratio)				
	3:1	2:3	1:1	1:2	1:3	3:1	2:3	1:1	1:2	1:3	3:1	2:3	1:1	1:2	1:3
1	1.1 0	1.11	1.1 1	1.1 6	1.2 0	1.20	1.04	1.13	1.12	1.29	1.13	1.09	1.18	1.28	1.29
2	1.1 2	1.12	1.1 3	1.1 6	1.1 4	1.20	1.07	1.05	1.09	1.18	1.16	1.06	1.05	1.20	1.38
3	1.1 2	1.09	1.0 9	1.1 6	1.1 4	1.20	1.07	1.08	1.09	1.18	1.16	1.09	1.12	1.20	1.25
4	1.1 0	1.06	1.1 2	1.1 3	1.1 8	1.17	1.07	1.08	1.09	1.18	1.13	1.12	1.19	1.20	1.21
5	1.1 0	1.06	1.1 2	1.1 3	1.1 5	1.17	1.05	1.08	1.09	1.18	1.13	1.12	1.20	1.20	1.26
6	1.1 0	1.06	1.1 0	1.1 7	1.1 5	1.17	1.05	1.11	1.09	1.18	1.13	1.12	1.23	1.20	1.21
7	1.1 0	1.03	1.1 0	1.1 7	1.1 2	1.13	1.05	1.13	1.09	1.18	1.13	1.09	1.23	1.20	1.18
8	1.1 0	1.03	1.0 8	1.1 3	1.1 2	1.13	1.05	1.13	1.09	1.18	1.10	1.09	1.16	1.21	1.22
9	1.1 0	1.03	1.1 0	1.1 3	1.1 3	1.13	1.05	1.11	1.09	1.18	1.10	1.13	1.13	1.21	1.23
10	1.1 0	1.03	1.0 8	1.1 3	1.1 5	1.13	1.07	1.14	1.09	1.19	1.10	1.13	1.13	1.21	1.23



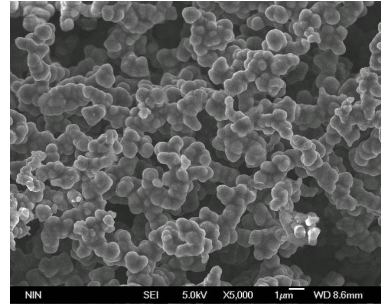
(a)

(b)

(c)

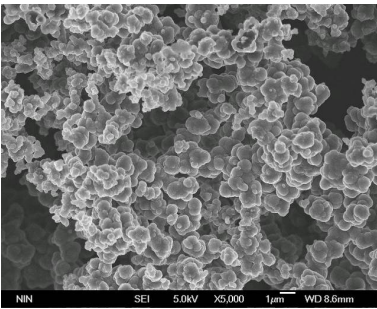


(d)

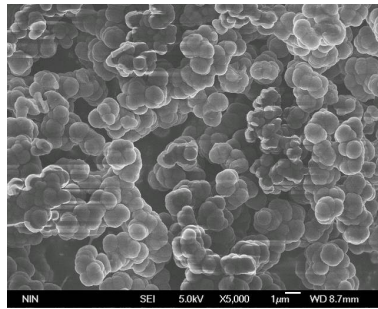


(e)

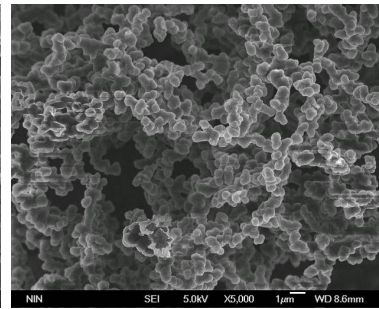
Fig S1 SEM images of PPy/pTS⁻ with different mole ratio of Pyrrole and pTS⁻: (a) 3:1; (b) 2:1; (c) 1:1; (d) 1:2; (e) 1:3



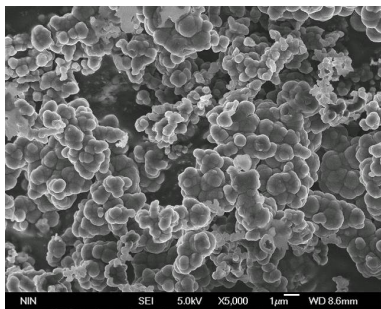
(a)



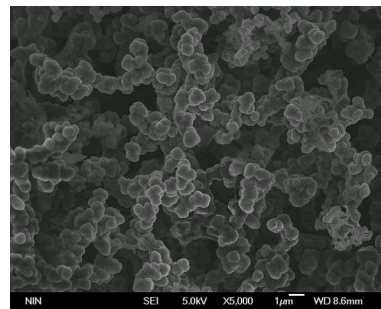
(b)



(c)

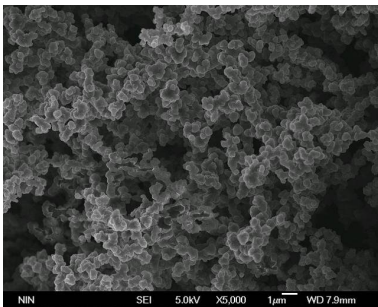


(d)

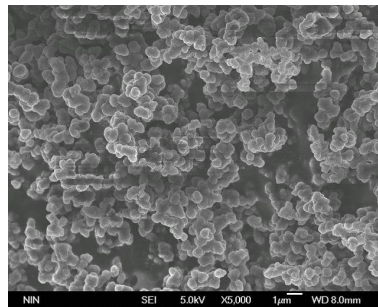


(e)

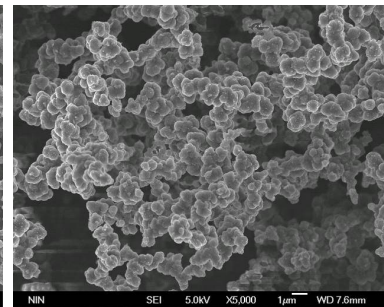
Fig S2 SEM images of PPy/pTS⁻ with different mole ratio of Pyrrole and BS⁻: (a) 3:1; (b) 2:1; (c) 1:1; (d) 1:2; (e) 1:3



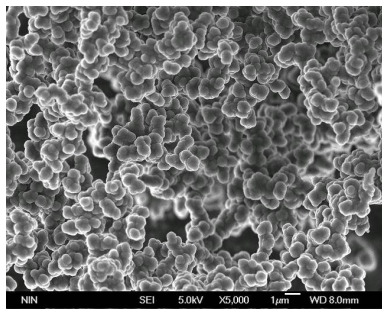
(a)



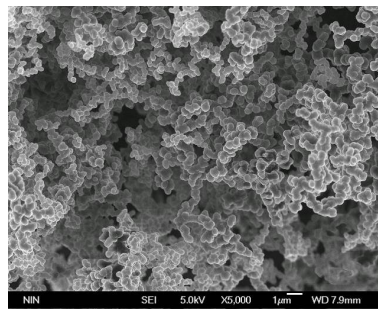
(b)



(c)



(d)



(e)

Fig S3 SEM images of PPy/pTS⁻ with different mole ratio of Pyrrole and NO₃⁻: (a) 3:1; (b) 2:1; (c) 1:1; (d) 1:2; (e) 1:3

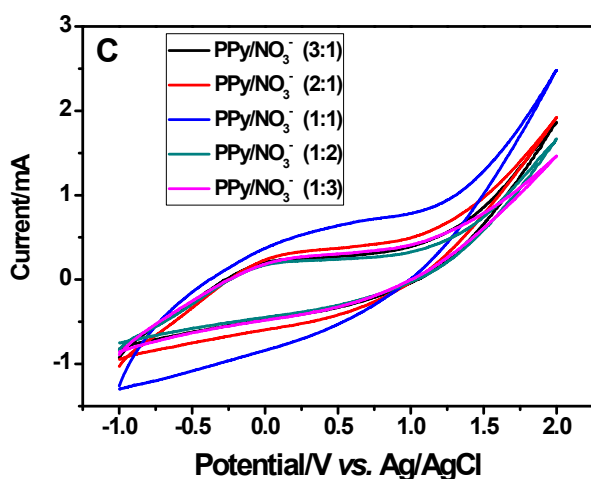
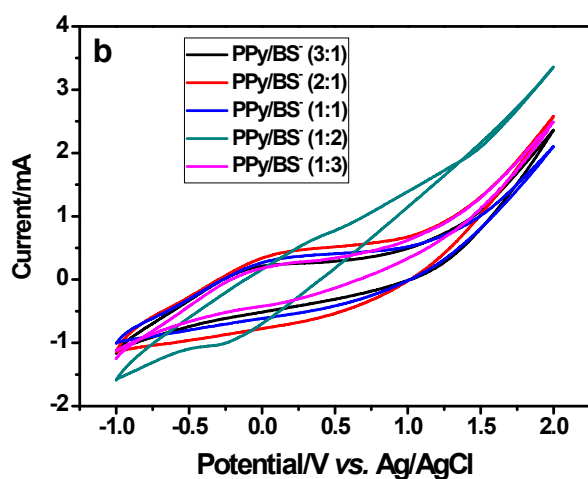
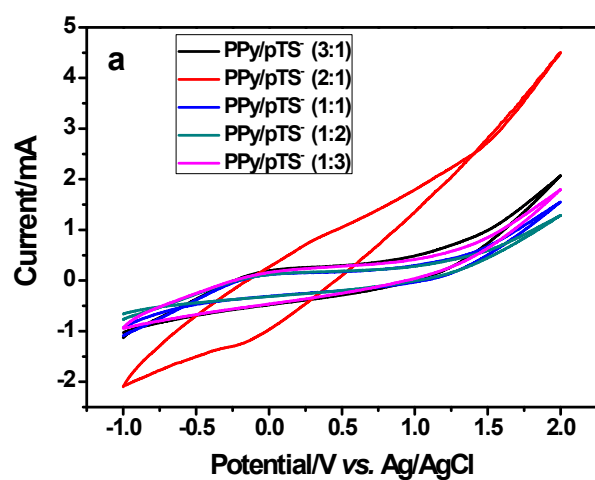


Fig.S4 Cyclic voltammograms of the PPy/A⁻ with different doping ratios; other operation conditions: concentration of Na⁺ is 1000 mg·L⁻¹; voltage is 2.0 V; adsorption time is 3.0 h