Electronic Supplementary Material (ESI) for RSC Advances

Metal-free oxygen reduction electrodes based on thin PEDOT films with high electrocatalytic activity

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(Electronic Supplementary Information)

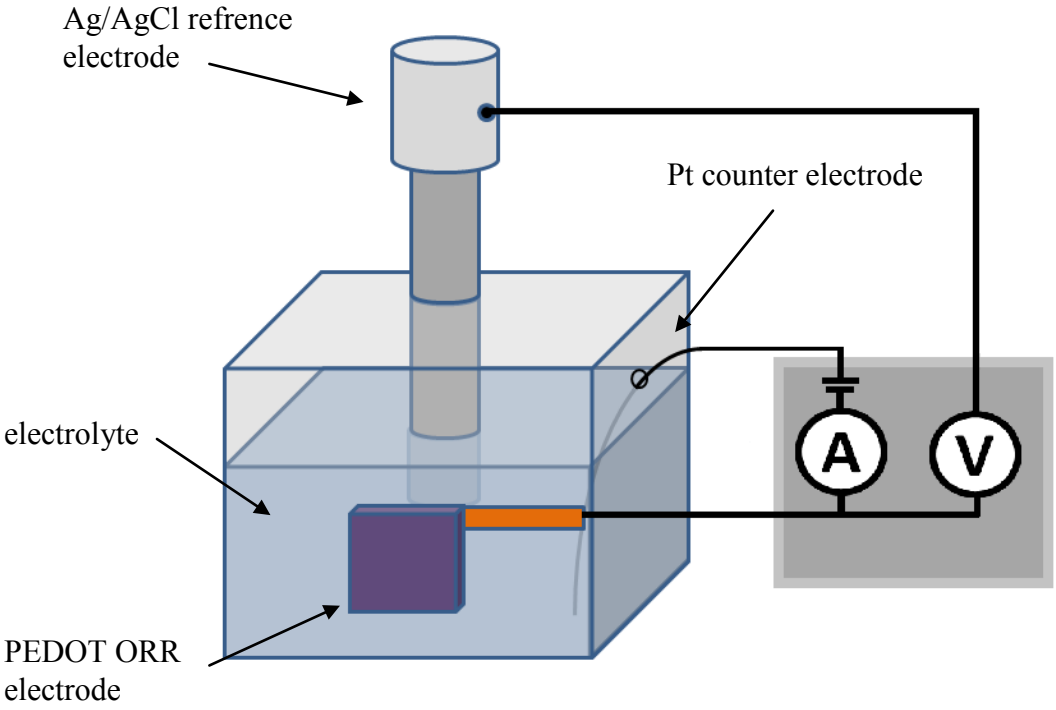

Figure S1. A schematic view of the three-electrode cell experimental setup used for ORR performance measurement.

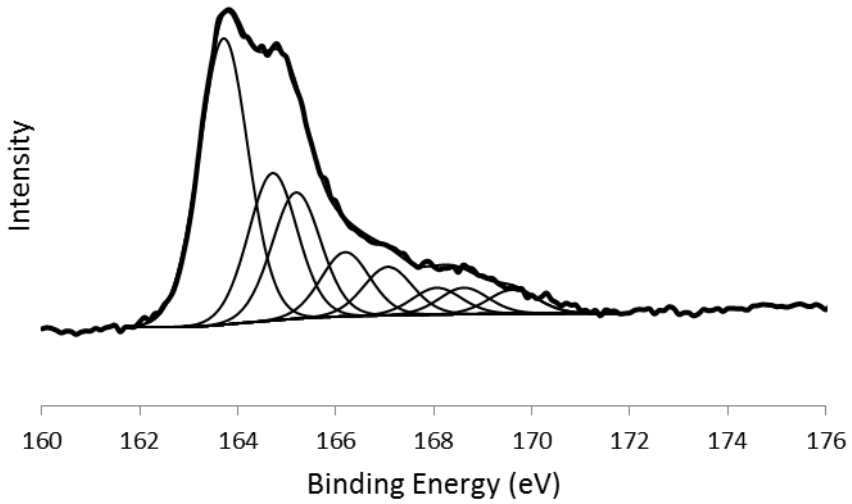

Figure S2. Typical deconvulotion of S2p peak of XPS spectrum of PEDOT based 5800 Da. block copolymer.

Table S1. The outcome of deconvulotion of S2p peak of XPS spectrum of PEDOT samples and the calculated doping level.

Position (eV)	163.7	164.7	165.2	166.2	168.6	169.6	167.1	168.1	
Peak assignment	Thio[a)] S2p1/2	Thio S2p3/2	Thio+ S2p1/2	Thio+ S2p3/2	H-Tos[b)] S2p1/2	H-Tos S2p3/2	Tos^+ S2p1/2	Tos^+ S2p3/2	Dop. Level
PEDOT/2900Da PEG-PPG-PEG	32.78	18.46	13.3	7.24	2.47	2.27	13.84	9.64	28.6
PEDOT/5800Da PEG-PPG-PEG	30.23	16.06	15.33	7.62	3.93	2.84	14.45	9.54	33.1
Urea treated PEDOT	37.51	18.93	15.68	8.44	3.07	2.60	7.73	6.04	29.9

[a)]: Thio: S atom in thiophene rings of PEDOT; [b)]: Tos: S atoms of tosylat groups.

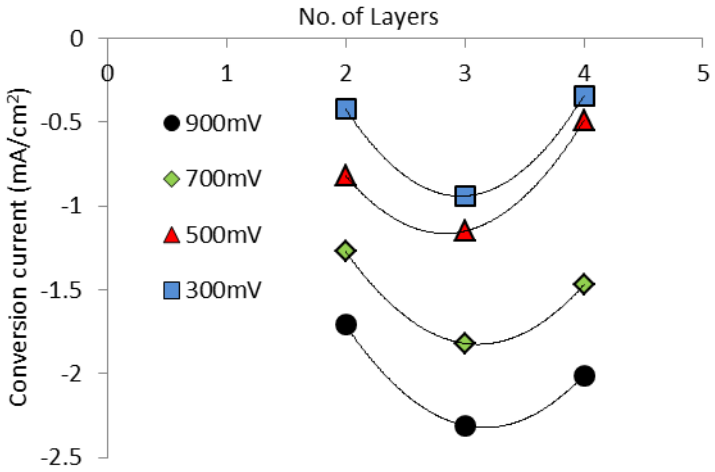

Figure S3. Conversion current density versus number of PEDOT layers on 220nm membrane, at various potentials,

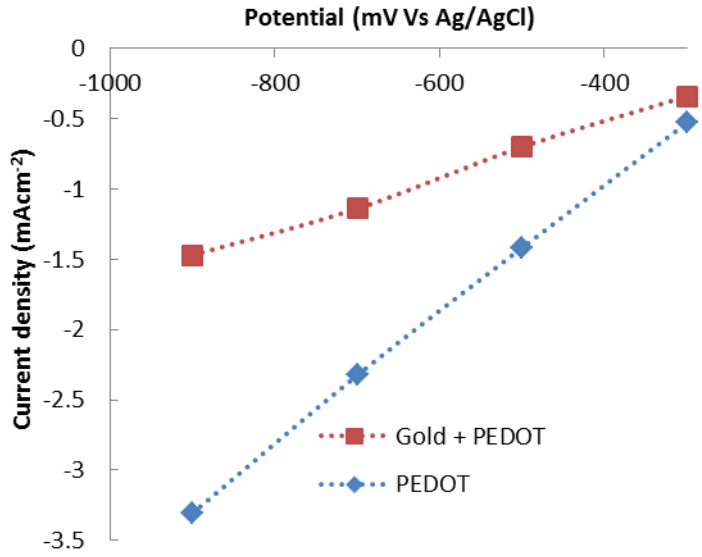

Figure S4. Conversion current density as a function of applied potential for PEDOT electrodes with and without a gold under-layer. This test is performed in a pH7 buffer solution.

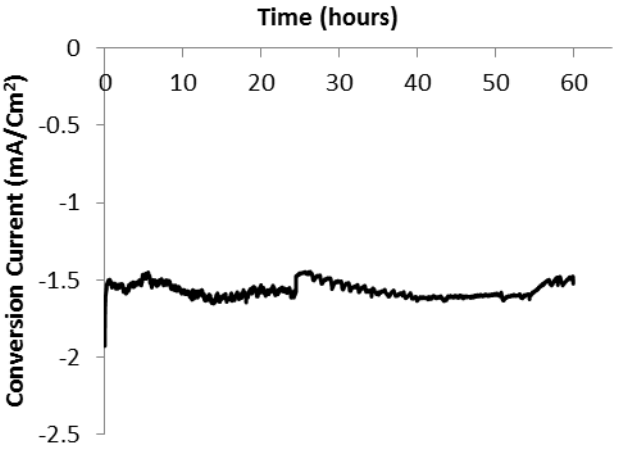

Figure S5. Long term testing operating at pH7 and applied potential of -0.5 V.