

SUPPORTING INFORMATION

Electrogelation of PEDOT:PSS and its Copolymers for Bioelectronics

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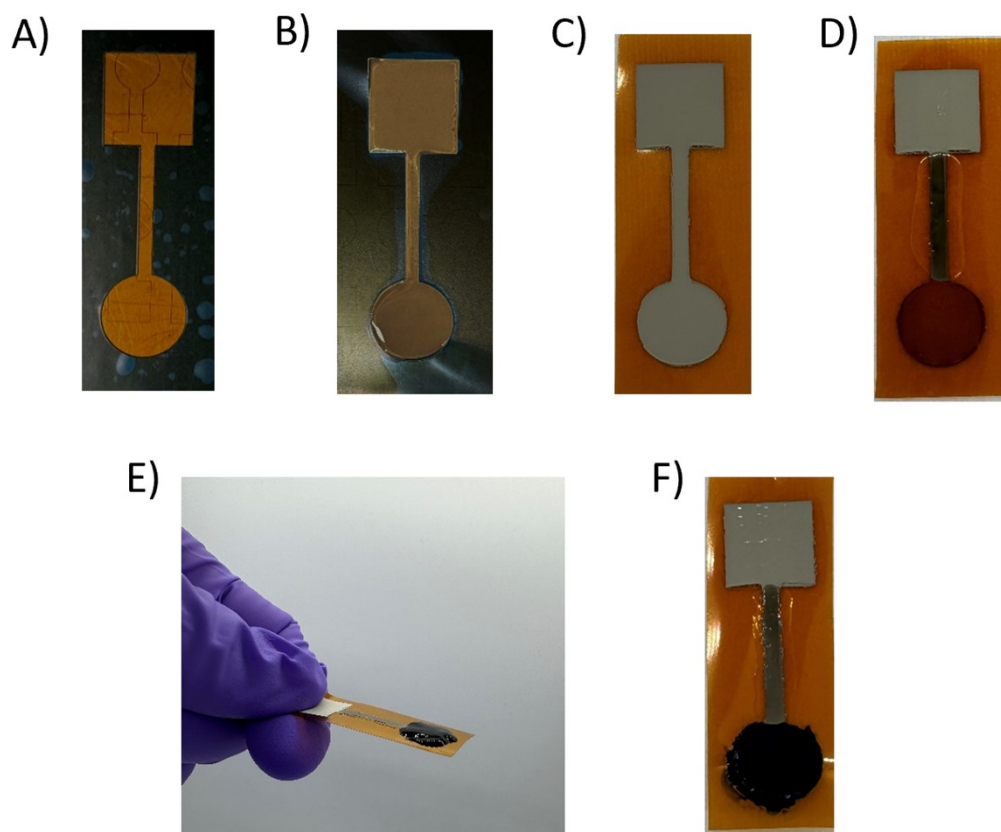


Figure S1. Circular electrode with a diameter of 10mm displayed at each stage of the electrode fabrication process. A) Blue silicon tape mask adhered to the Kapton substrate B) Silver nanoparticle paste deposited over the mask C) Cured silver nanoparticle electrode on kapton substrate D) silver electrode electrochemically copperplated in 40mM CuSO_4 in 5% acetic acid solution E) After 500 sec of electrogelation, the PEDOT:PSS gel is formed on the surface of the electrode F) PEDOT:PSS electrogelated electrode after annealing at 100° for 5 minutes.

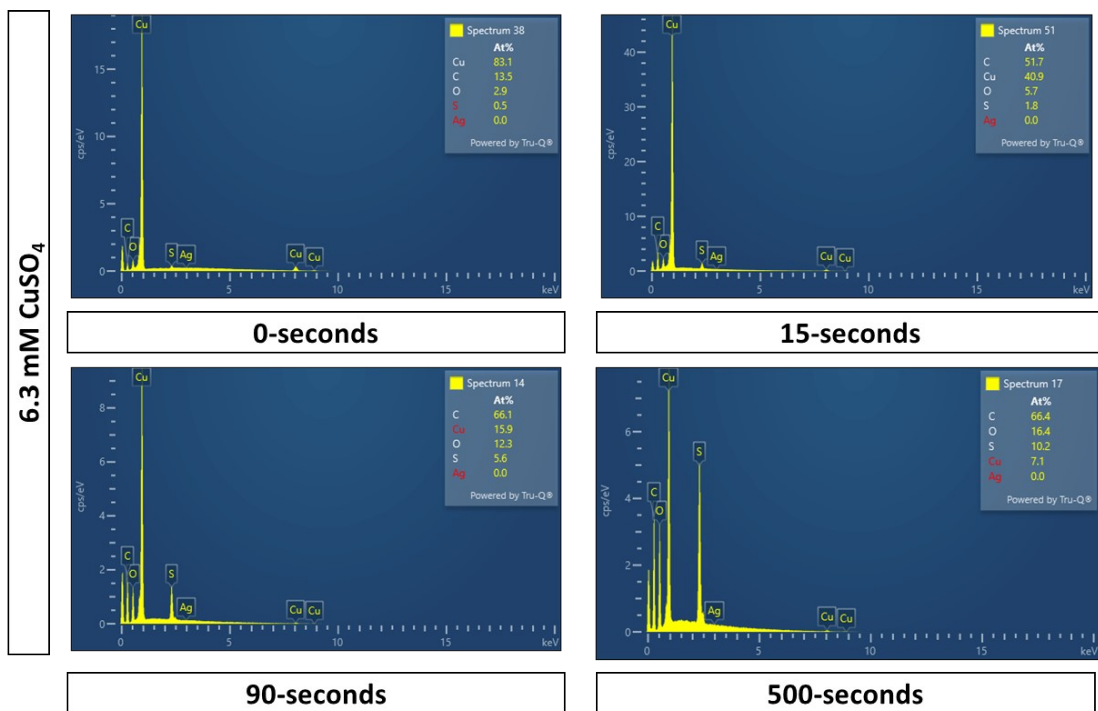


Figure S2. EDX spectra of 1 cm diameter electrodes copper electroplated at 6.3 mM of CuSO₄ and 0, 15, 90 and 500-sec of PEDOT:PSS electrogelation

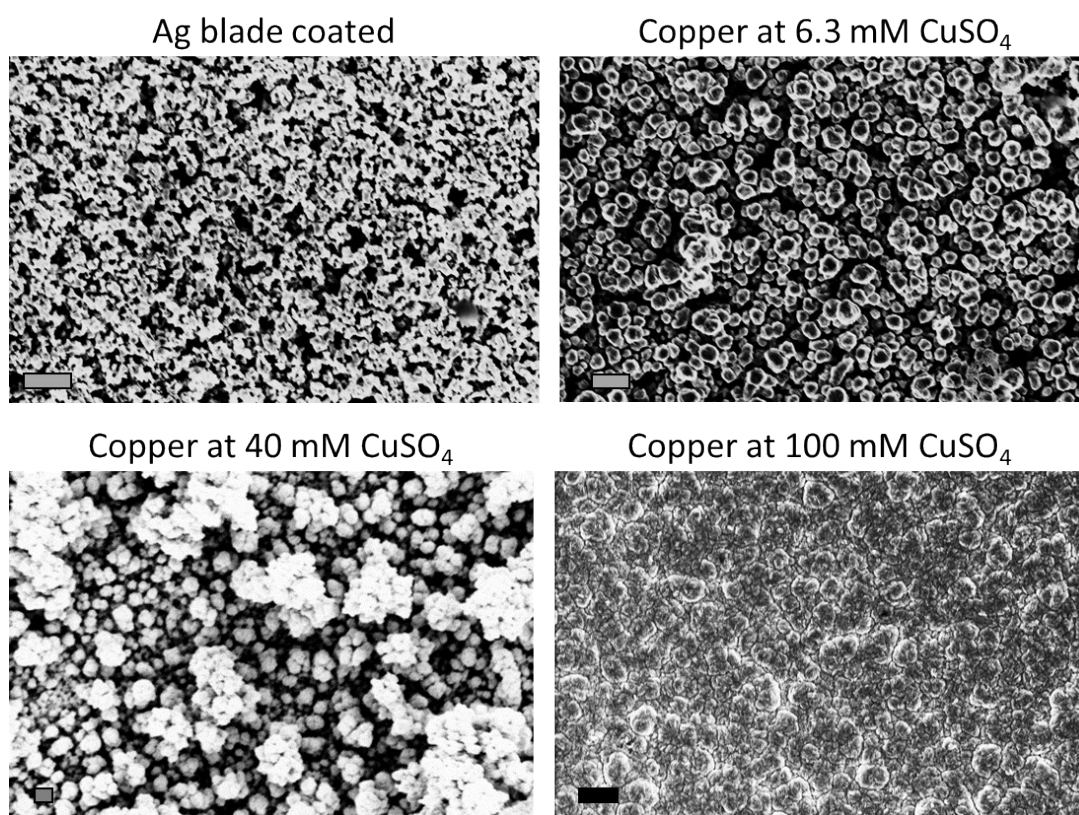


Figure S3. SEM images of 1 cm diameter electrodes for blade-coated silver and copper electroplated at 6.3, 40 and 500 mM of CuSO₄ (bar scale: 1μm)

6.3 mM of CuSO ₄				
	0-sec	15-sec	90-sec	500-sec
Copper (Cu)	81.2 ± 16.0	57.0 ± 6.2	14.6 ± 2.3	7.3 ± 1.0
Sulphur (S)	0.8 ± 0.8	1.7 ± 0.6	7.9 ± 2.3	11.7 ± 1.5
Silver (Ag)	0.37 ± 0.4	0.2 ± 0.4	0.0 ± 0.0	0.0 ± 0.0

40 mM of CuSO ₄				
	0-sec	15-sec	90-sec	500-sec
Copper (Cu)	97.3 ± 2.9	32.8 ± 12.1	82.8 ± 14.3	5.7 ± 0.71
Sulphur (S)	0.0 ± 0.0	3.9 ± 1.0	0.7 ± 1.0	9.5 ± 0.7
Silver (Ag)	0.0 ± 0.0	0.1 ± 0.2	2.05 ± 2.9	0.0 ± 0.0

100 mM of CuSO ₄				
	0-sec	15-sec	90-sec	500-sec
Copper (Cu)	85.9 ± 4.0	65.5 ± 7.13	6.5 ± 1.3	12.2 ± 6.9
Sulphur (S)	0.2 ± 0.3	1.0 ± 0.1	7.7 ± 0.5	7.3 ± 0.8
Silver (Ag)	0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.1	0.0 ± 0.0

Table S1. Composition of electrodes electroplated at three different CuSO₄ concentrations and its respective electrogelation of PEDOT:PSS times

		0-sec	15-sec	90-sec	500-sec
Particle Size (µm)	6.3 mM of CuSO ₄	0.8 ± 0.2	1.9 ± 0.4	2.2 ± 0.8	2.8 ± 0.8
	40 mM of CuSO ₄	1.5 ± 0.4	1.9 ± 0.9	1.9 ± 0.7	4.4 ± 1.1
	100 mM of CuSO ₄	2.1 ± 0.7	1.5 ± 0.7	2.7 ± 1.2	2.6 ± 0.8
	Silver electrode	0.9 ± 0.3			

Table S2. Particle size was measured on the electrodes using different CuSO₄ electrolyte concentrations and three different electrogelation times

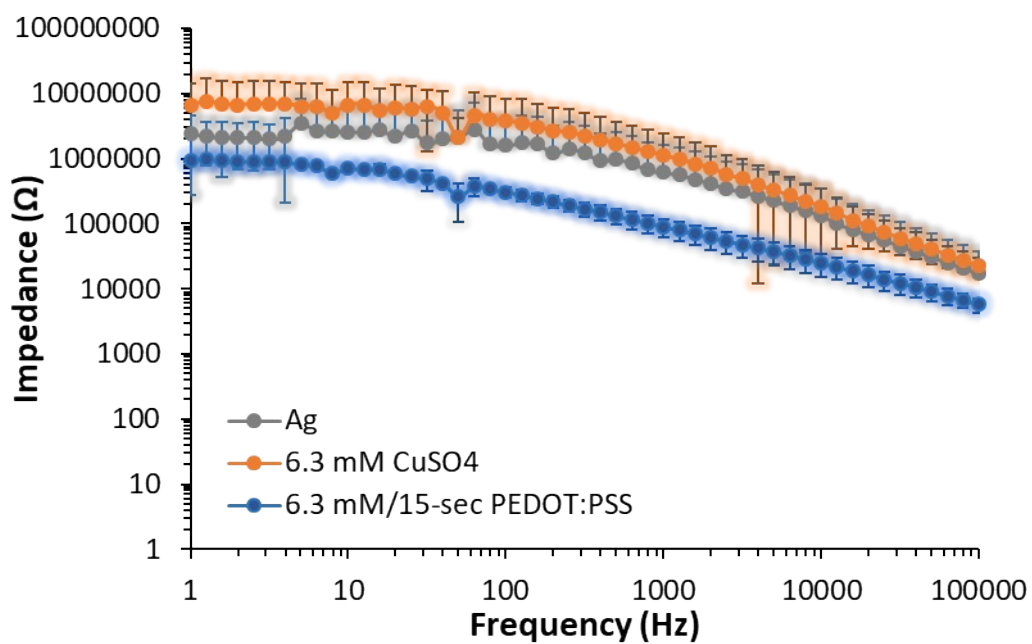


Figure S4. EIS of the circular electrodes (1 cm diameter) on the skin of silver, copper electroplated and 15-sec PEDOT:PSS electroplated electrodes

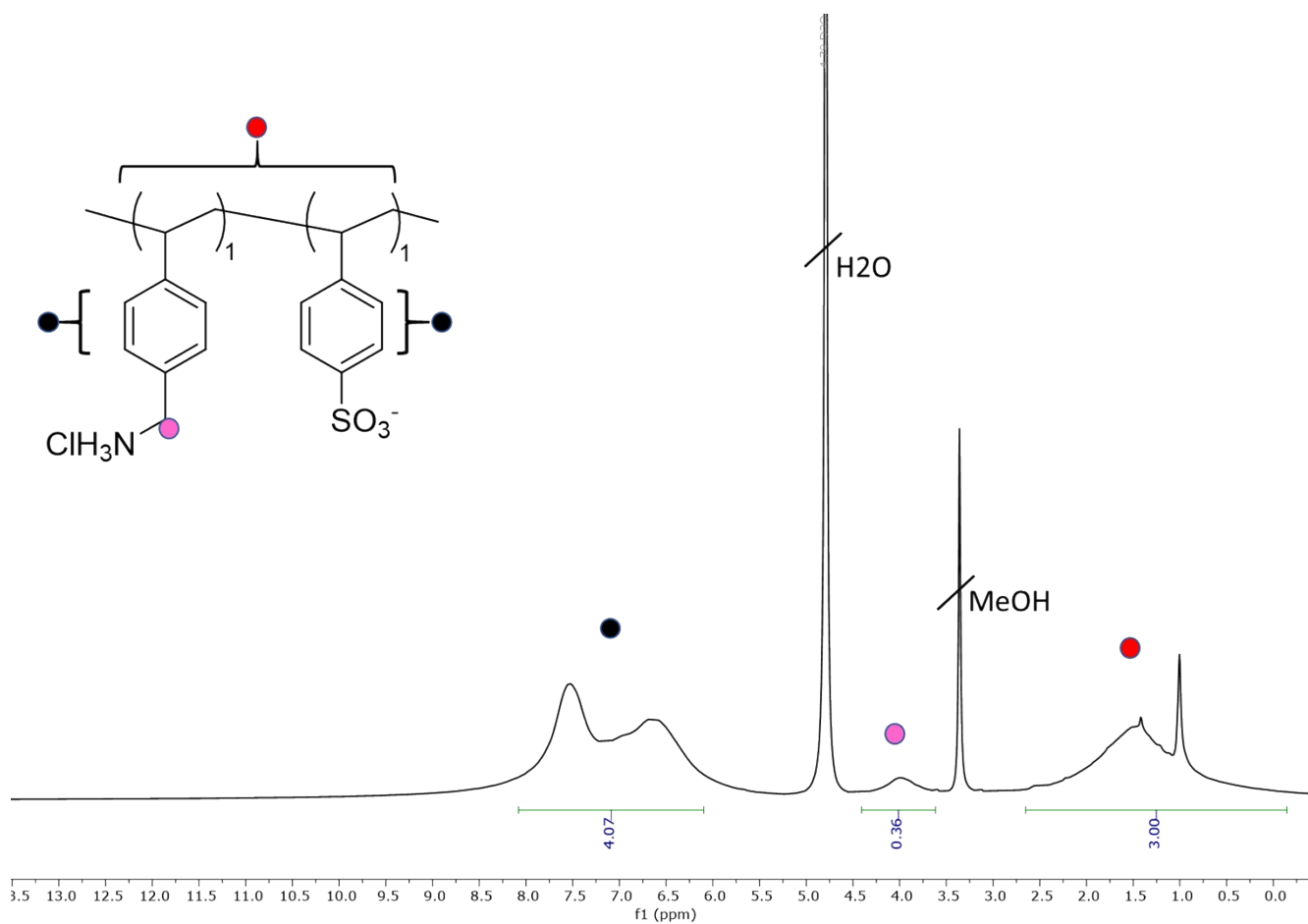


Figure S5. ^1H NMR of the polystyrene sulfonate-co-styrene methenamine (PEDOT:PSS-co-PSMA) copolymer

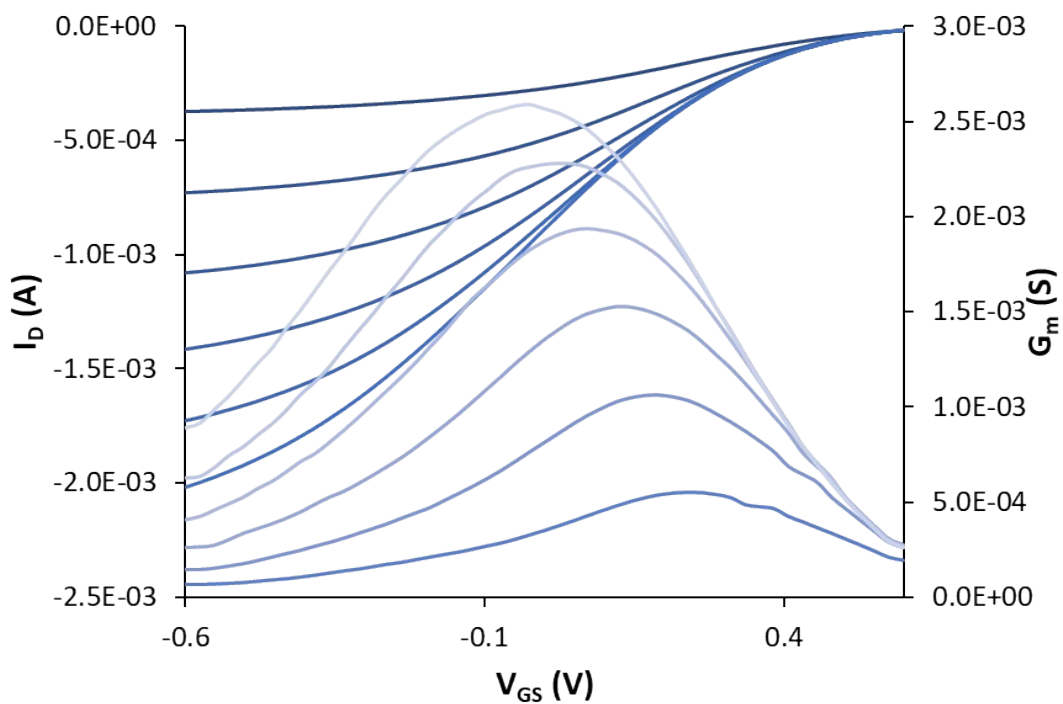


Figure S6. Transfer-characteristics and transconductance peaks at varying drain voltages from 0 to -0.6V of an OEET with a channel of $L = 600\mu\text{m}$, $W = 70\mu\text{m}$, and a Ag/Cu/PEDOT:PSS gate with $R = 2\text{mm}$