

## Electronic Supporting Information

### **Enhancing the performance of transparent and highly stretchable organic electrochemical transistors by acid treatment and copolymer blending of electrospun PEDOT:PSS fibers**

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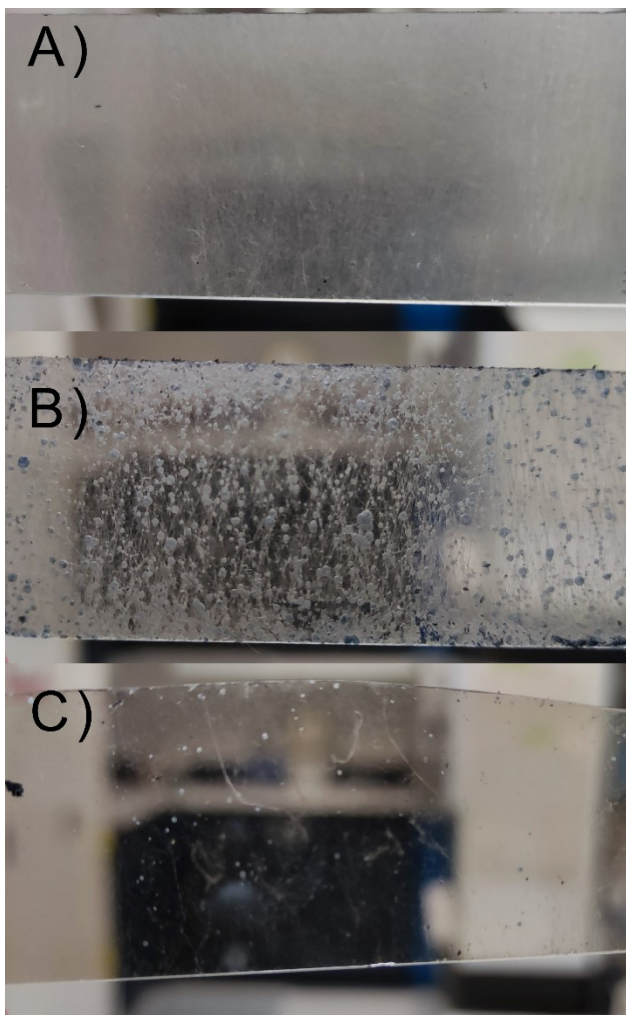


Fig. S1 Pictures of electrospun fibers prepared from mixtures of PEG-PPG-PEG 15 wt% (A), PEG 3 wt% (B), and PEG 15wt% (C) .

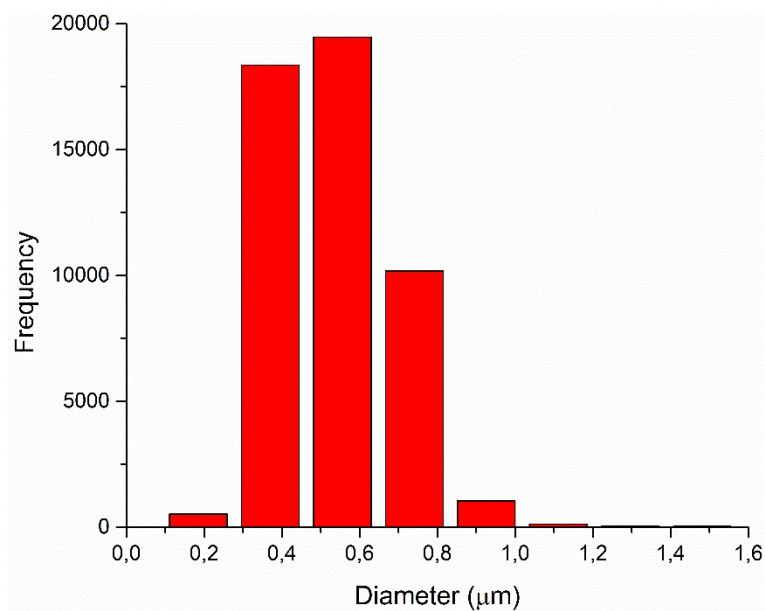


Fig. S2 Fiber diameter distribution of PEDOT:PSS/PEG fibers treated with sulfuric acid, obtained from SEM images.

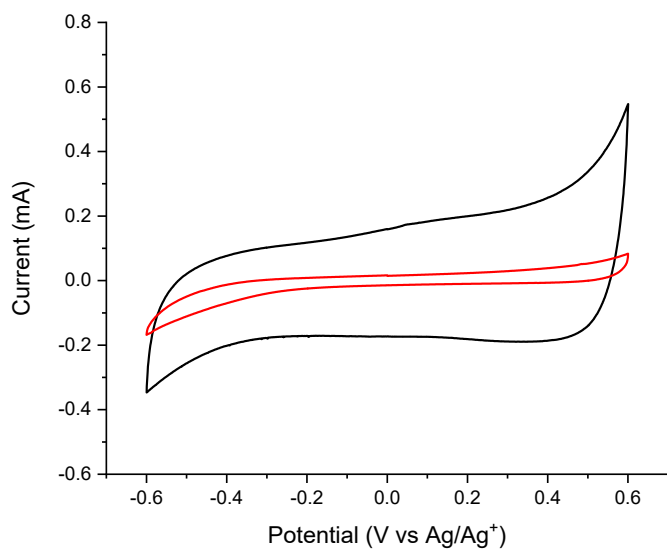


Fig. S3 Cyclic voltammogram of acid treated fibers (—) and non-treated fibers (—) in NaCl (0.1 M) at a scan rate of 100 mV/s.

### Specific Capacitance ( $C_p$ ) calculation

The specific capacitance can be calculated from the voltammograms according to the following:

$C_p = \frac{A}{m \cdot k \cdot \Delta V}$ , where  $A$  is the integrated area from the voltammograms;  $m$  the mass of PEDOT:PSS fibers;  $k$  the scan rate (100 mV/s); and  $\Delta V$  the potential window (1.2 V).

The mass  $m$  of fibers deposited on the electrode was estimated as per the following:

1. The flow rate for electrospinning was fixed at 0.1 mL/h and the electrospinning duration was 2000 sec, allowing to calculate the quantity of electrospun fibers: 0.055 mL or 0.058 g.
2. The amount of fibers was assumed to be uniformly deposited on the cylindrical collector, allowing the calculation of a fiber density. The surface of the collector was of 113.1 cm<sup>2</sup>, giving a surface density of 5.21 x 10<sup>-4</sup> g/cm<sup>2</sup>.
3. The active surface of the electrode was fixed to 25 mm<sup>2</sup>, then the amount of fibers involved in the electrochemical reaction was 1.30 x 10<sup>-5</sup> g.

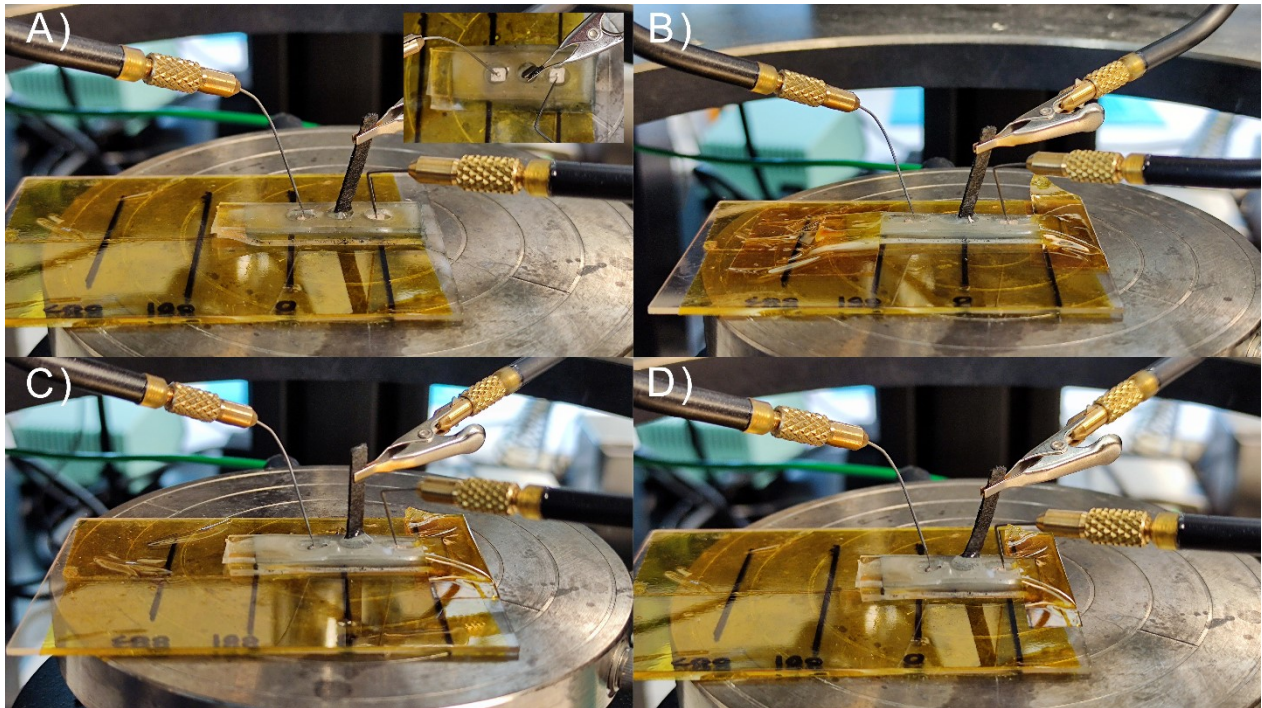


Fig. S4 Optical pictures of a stretchable OEET at 0% strain (A), 100% strain (B), after being released from strain (C) and 30 minutes after the release of the strain (D).



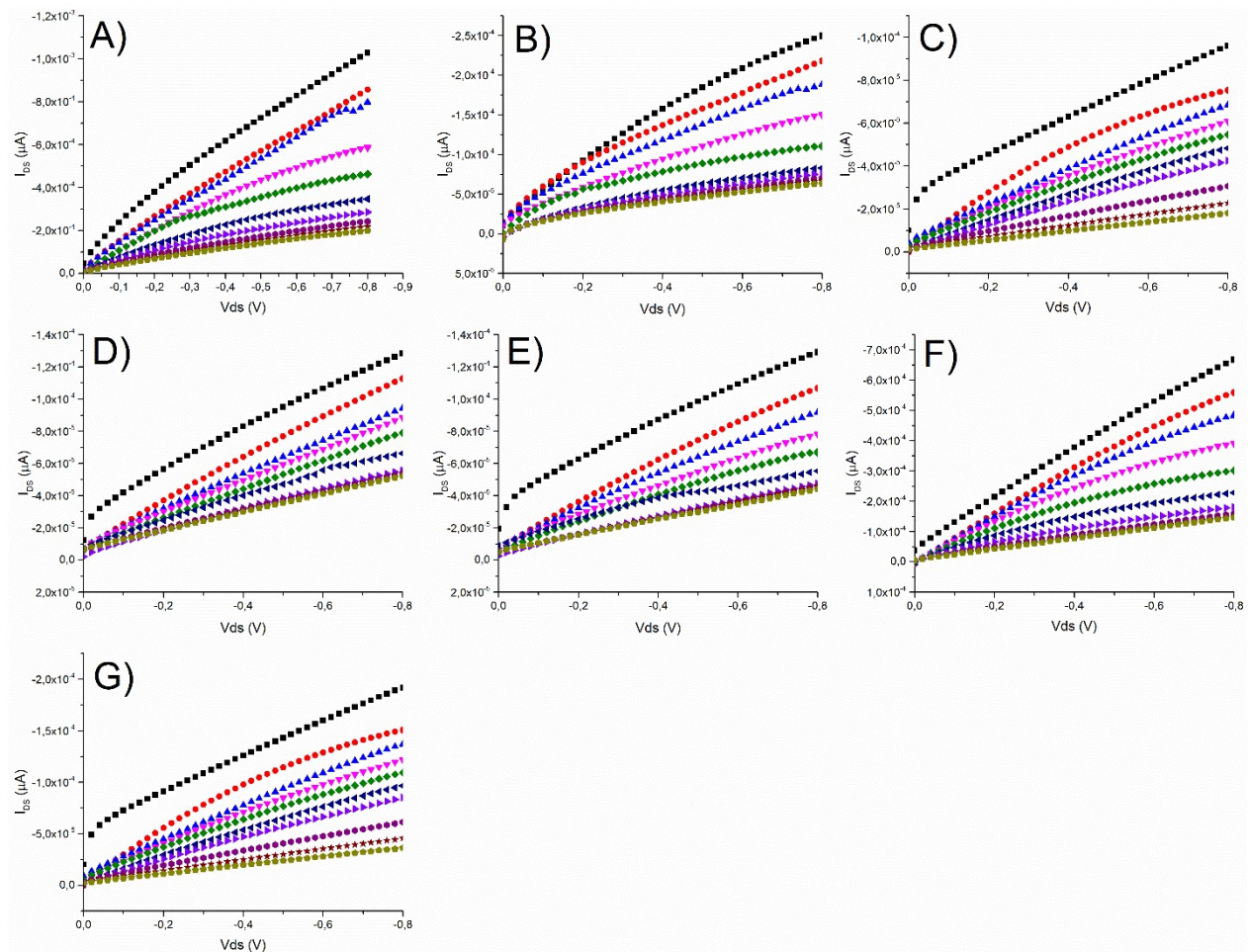


Fig. S5 Output curves of the stretchable OECTs in the initial state (A), stretched to 50% (B), 100% strain (C), held at 100% strain for 10 hours (D), released to the initial state (E), before the cycling test (F), and stretched 100 times to 100% strain (G) with applied gate voltages of: -1 (■), -0.8 (●), -0.6 (▲), -0.4 (◻), -0.2 (◆), 0 (↑), 0.2 (▶), 0.4 (◻), 0.6 (⊕), and 0.6 (△) V.