

# Supporting Information

## Transparent Conductive Silk Film with a PEDOT-OH Nano Layer as an Electroactive Cell Interface

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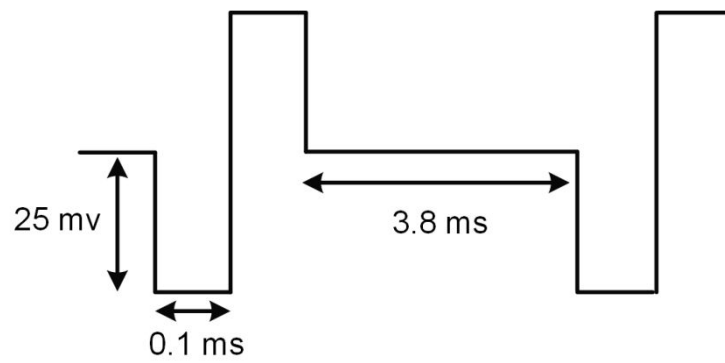
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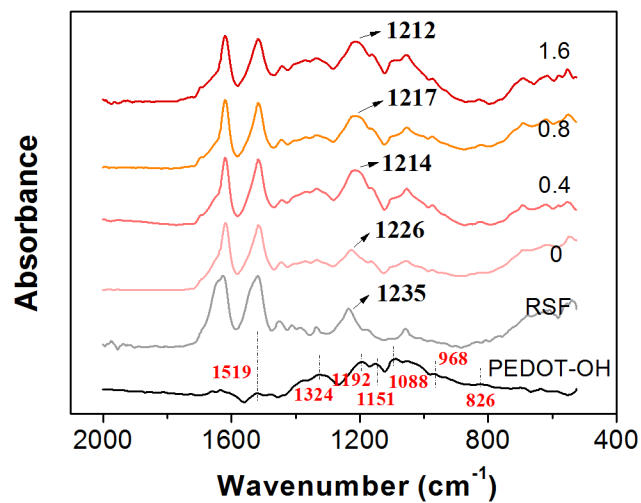
Prof. Yaopeng Zhang, E-mail: [zyp@dhu.edu.cn](mailto:zyp@dhu.edu.cn);

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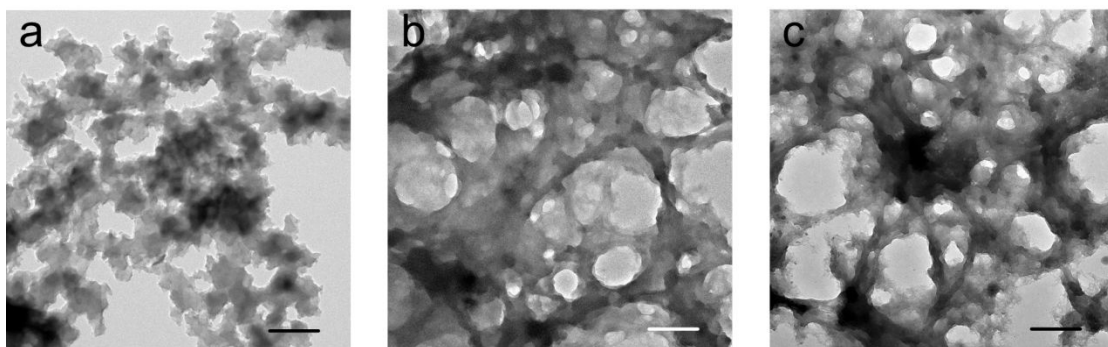
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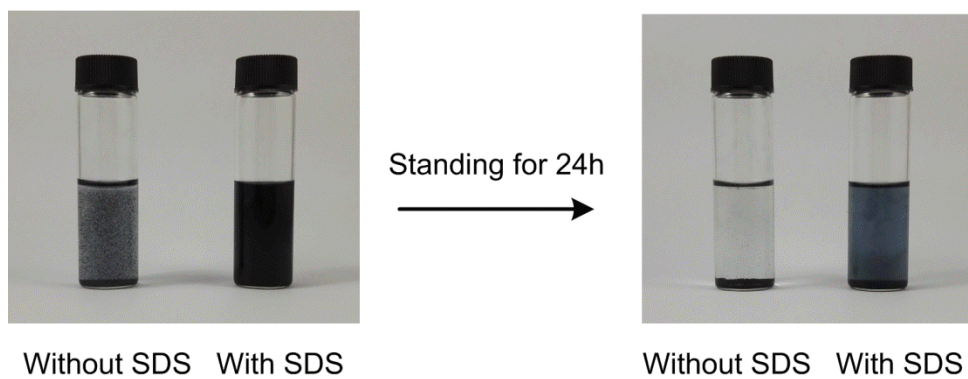
**Figure S1.** Illustration of the electric signal released on cells.



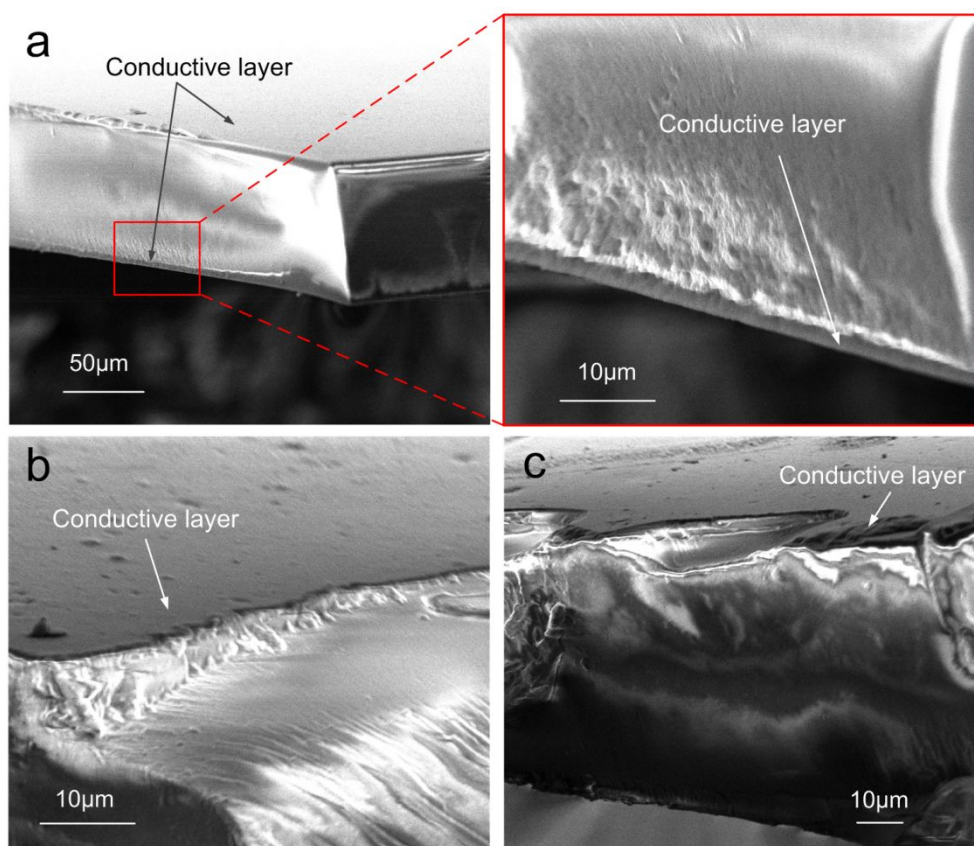
**Figure S2.** FTIR spectra of PEDOT-OH, pristine RSF and RSF/PEDOT-OH films with  $n(\text{FeCl}_3)/n(\text{monomer}) = 0.1$  and gradient SDS dosage in  $\text{FeCl}_3$  system.



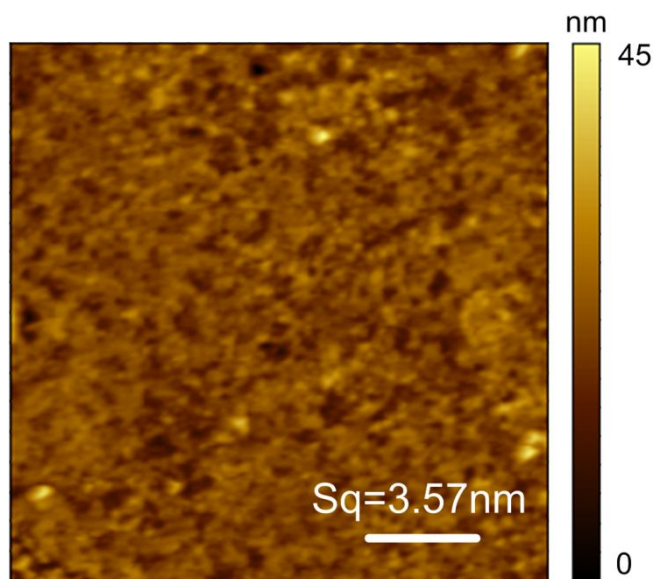
**Figure S3.** TEM images of PEDOT-OH polymerized in water in (a) single  $\text{FeCl}_3$  system (b) single APS system (c) and composite oxidant system. Scale bar represents 500 nm.



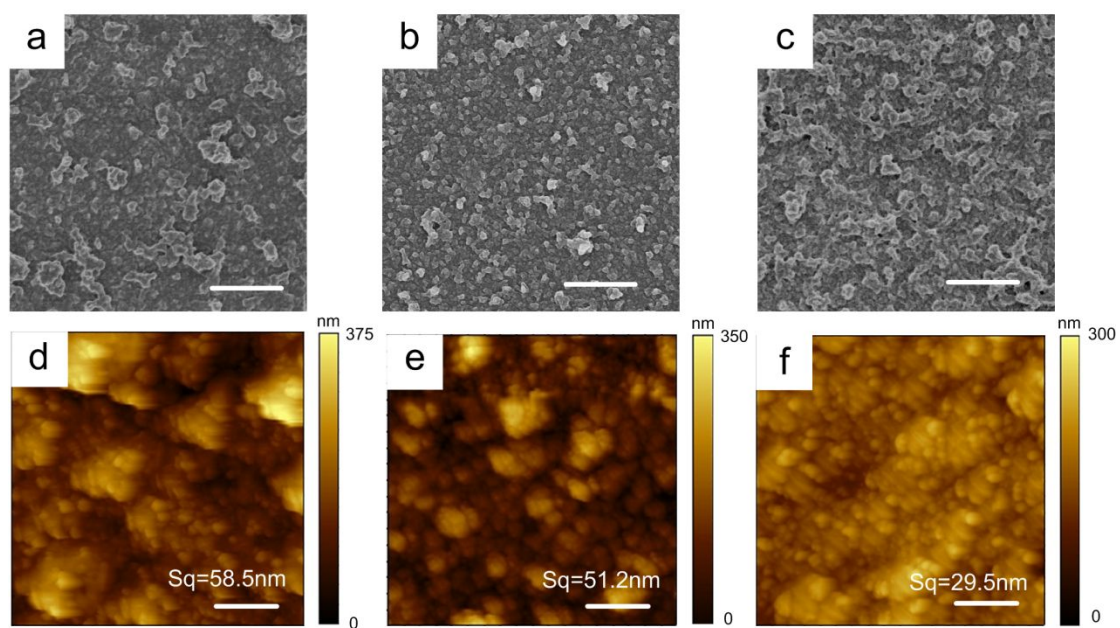
**Figure S4.** Photos of aqueous systems with or without SDS after polymerization in  $\text{FeCl}_3$  system.



**Figure S5.** SEM of the conductive layer on RSF surface at different positions. The film was produced in composite oxidants system with  $n(\text{FeCl}_3)/n(\text{monomer}) = 0.5$ ,  $n(\text{APS})/n(\text{monomer}) = 1$ .



**Figure S6.** AFM image of the surface of the pristine RSF film. Scale bar: 1  $\mu\text{m}$ .



**Figure S7.** SEM and AFM images of the surface of RSF/PEDOT-OH films with (a) (d)  $n(\text{SDS})/n(\text{monomer}) = 0.4$ ,  $n(\text{FeCl}_3)/n(\text{monomer}) = 0.5$ , (b) (e)  $n(\text{SDS})/n(\text{monomer}) = 0.4$ ,  $n(\text{FeCl}_3)/n(\text{monomer}) = 0.1$ , (c) (f)  $n(\text{SDS})/n(\text{monomer}) = 0.8$ ,  $n(\text{FeCl}_3)/n(\text{monomer}) = 0.1$ . Scale bar: 1  $\mu\text{m}$ .