

Electronic Supplementary Information

Ionic liquid/water mixtures and ion gels as electrolytes for organic electrochemical transistors

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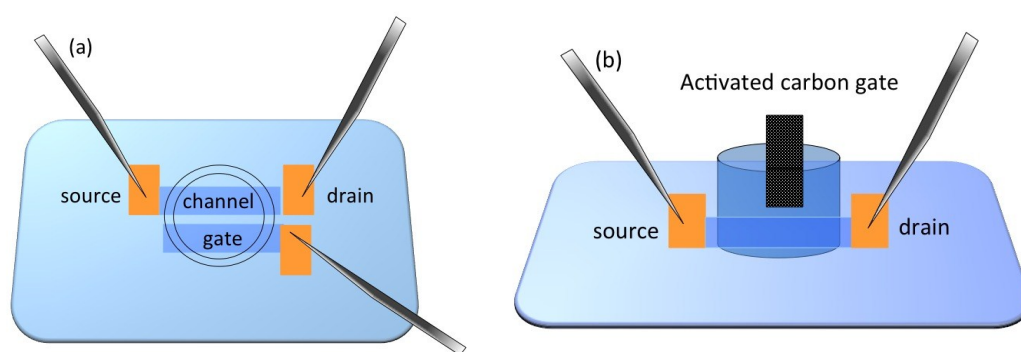


Fig. ES11 Device structure of the OEETs used in this work. Side view of an OEET employing a planar PEDOT:PSS gate (a). The distance between the parallel PEDOT:PSS stripes (channel and gate electrode) is 0.2 mm. Top view of an OEET employing an activated carbon gate (b). The gate is immersed into the electrolyte confined within a glass tube (cloning cylinder).

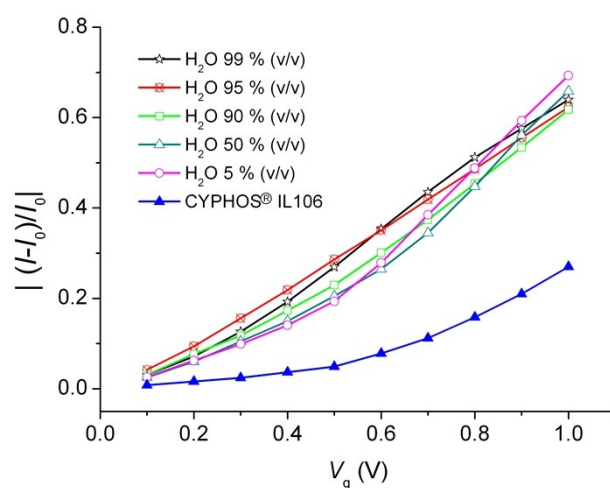


Fig. ES12: Current modulation $|I-I_0|/I_0$ versus V_g for OEETs using as the electrolyte Cyphos® IL 106/H₂O mixtures at different ratios, as specified in the legend. $V_d = -0.2$ V.

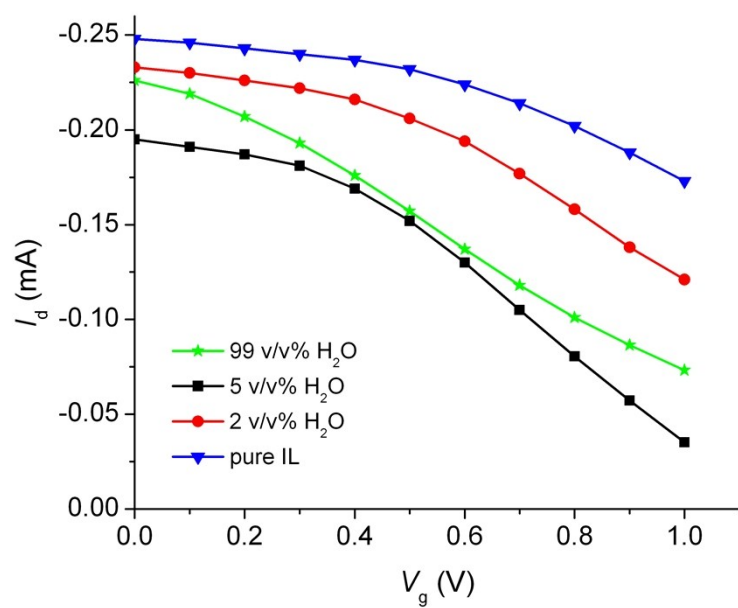


Fig. ESI3: Transfer characteristics of OECTs using as the electrolyte pure Cyphos® IL106 and Cyphos® IL 106/ H_2O mixtures. $V_d = -0.2$ V. See main text for details.

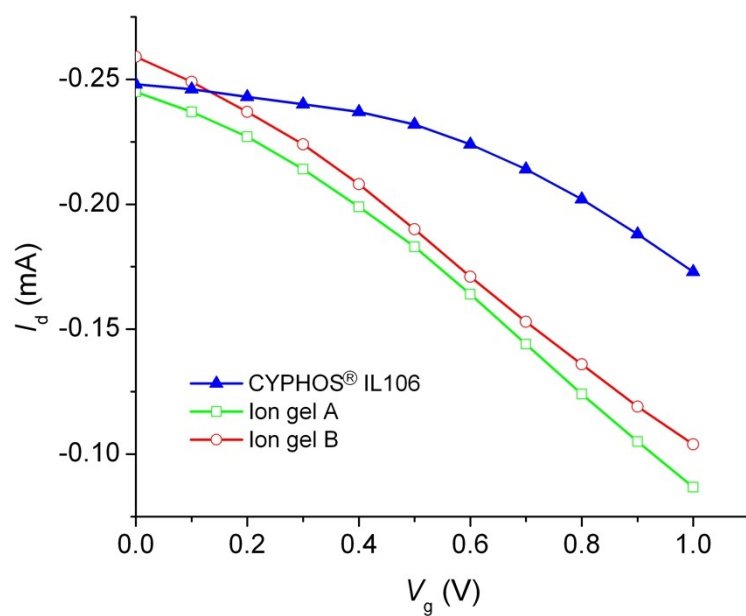


Fig. ESI4: Transfer characteristics of OECTs using as the electrolyte pure Cyphos® IL106 and ion gels A and B. $V_d = -0.2$ V. See main text for details.

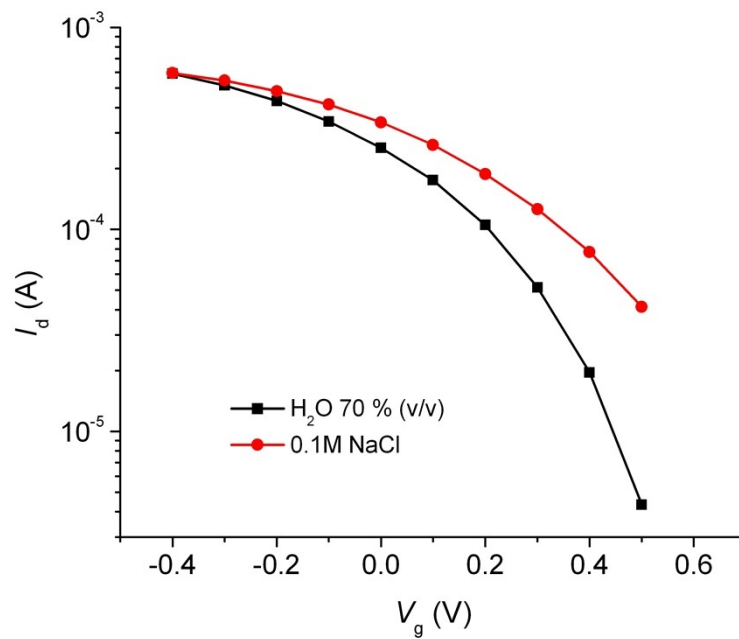


Fig. ESI5: Transfer curves of PEDOT:PSS OECTs making use of activated carbon as the gate electrode and Cyphos® IL106/ H_2O at 70% v/v and 0.1 M NaCl aqueous solutions as the gating media. $V_d = -0.5$ V.

Table ESI1. Ionic conductivity of Cyphos® IL 106/H₂O mixtures at different v/v ratios measured with a conductivity meter. Values for pure Cyphos® IL 106 and Cyphos® IL 106/H₂O mixture at H₂O 99% (v/v) have been validated by Electrochemical Impedance Spectroscopy (EIS). The measurements have been carried out at 22 °C.

H₂O % (v/v)	Ionic conductivity (σ) by conductivity meter (mS/cm)
Pure IL	0.06
2%	0.1
5%	0.3
10%	1
30%	6
50%	10
70%	12
90%	8
99%	1.5

Table ESI2. ON/OFF ratios of OECTs making use of an activated carbon gates and Cyphos® IL 106/H₂O mixtures as electrolytes.

H₂O % (v/v)	ON/OFF ratio
0 (Pure Cyphos® IL 106)	40
2	100
5	2500
10	5000
30	1200
50	700
70	70
90	60
99	40