Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Info

A Na^+ conducting hydrogel for protection of organic electrochemical transistors

I. del Agua,[a, b] L. Porcarelli,[a] V. F. Curto,[b,c] A. Sanchez-Sanchez,[b, c] E. Ismailova,[b] G. G. Malliaras,[b,c] and D. Mecerreyes*[a, d]

[a] *POLYMAT University of the Basque Country UPV/EHU, Joxe Mari Korta Center, Avda. Tolosa 72, 20018 Donostia-san Sebastian, Spain.*
[b] *Department of Bioelectronics, Ecole Nationale Supérieure des Mines, CMP-EMSE, MOC, 13541 Gardanne, France.*
[c] *Current address: Electrical Engineering Division, Department of Engineering, University of Cambridge, 9 JJ Thomson Avenue, Cambridge, CB3 0FA, United Kingdom*
[d] *Ikerbasque, Basque Foundation for Science, E-48011 Bilbao, Spain.*

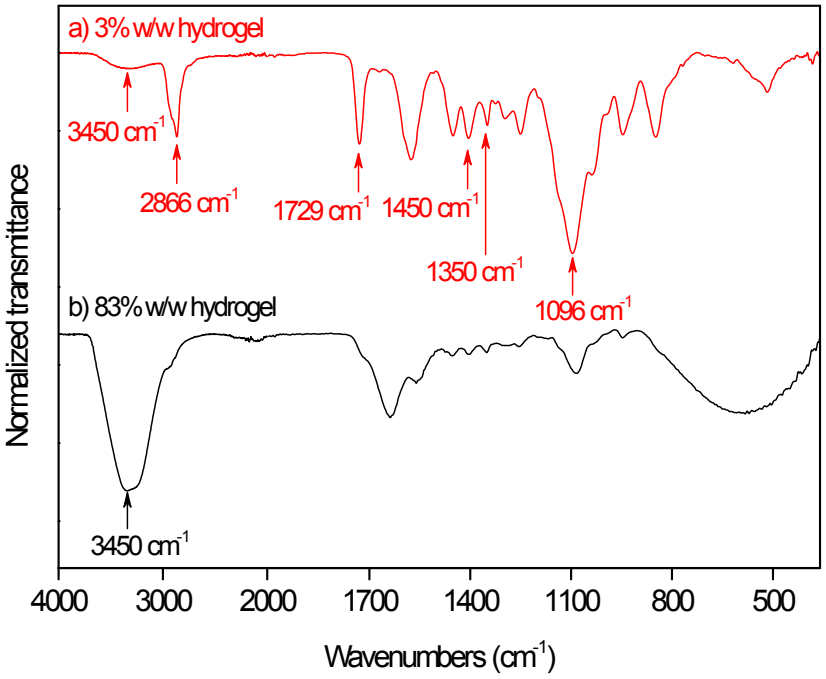

Figure S1. FTIR-ATR spectra of (a) 3% w/w hydrogel and (b) 83% w/w hydrogel.

To determine if un-reacted monomers were left in the hydrogels, we designed a simple ^{1}H-NMR spectroscopy experiment. The as-synthesized hydrogels were immersed for 24h in deuterated water. Then, the hydrogels was separated from the deuterated water and the latter was measured by ^{1}H-NMR spectroscopy. The ^{1}H-NMR spectrum of deuterated water should reveal traces of the un-reacted monomers. As it can be seen in from the bottom spectrum of figure S2, the characteristic signals of the monomers at 6.0 – 6.5 ppm disappeared. Therefore confirming complete hydrogel polymerization.

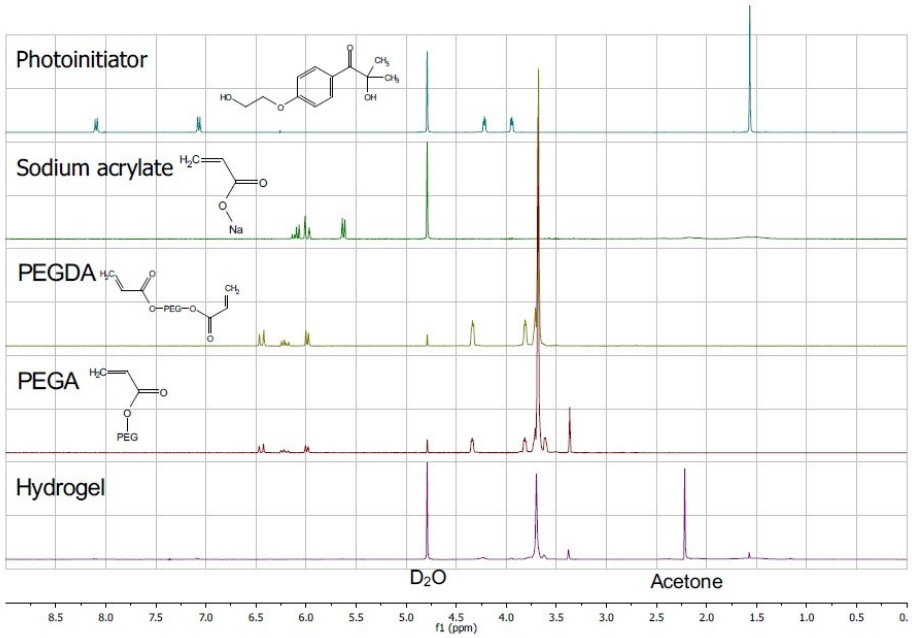

FIGURE S2. ^{1}H-NMR spectra in D_2O of 2-hydroxy-4'-(2-hydroxyethoxy)-2-methylpropiophenone, sodium acrylate, poly(ethylene glycol) diacrylate, poly(ethylene glycol) acrylate, and the ^{1}H-NMR spectrum of D_2O put in contact with an as-synthesized hydrogel during a period of 24 hours.

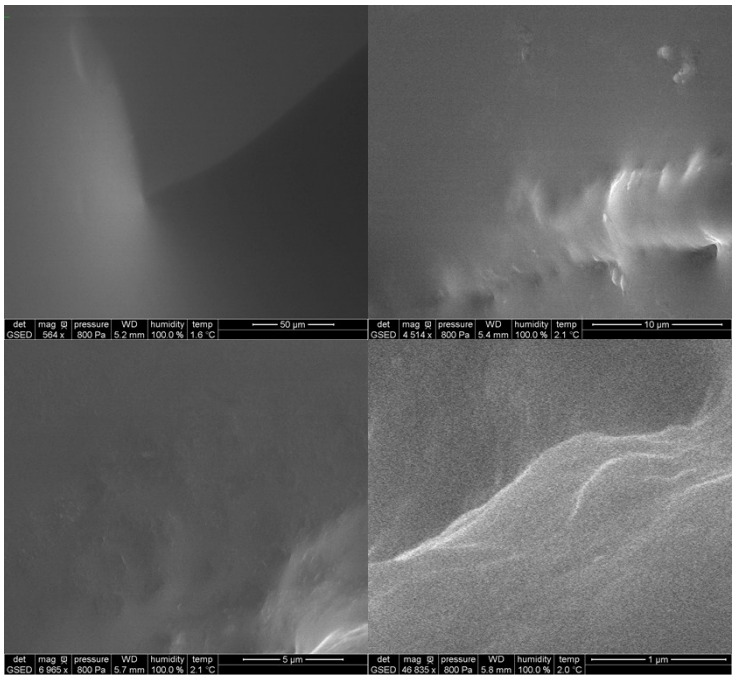

Figure S3. Environmental SEM picture of a 83% w/w hydrogel obtained at 100% relative humidity.

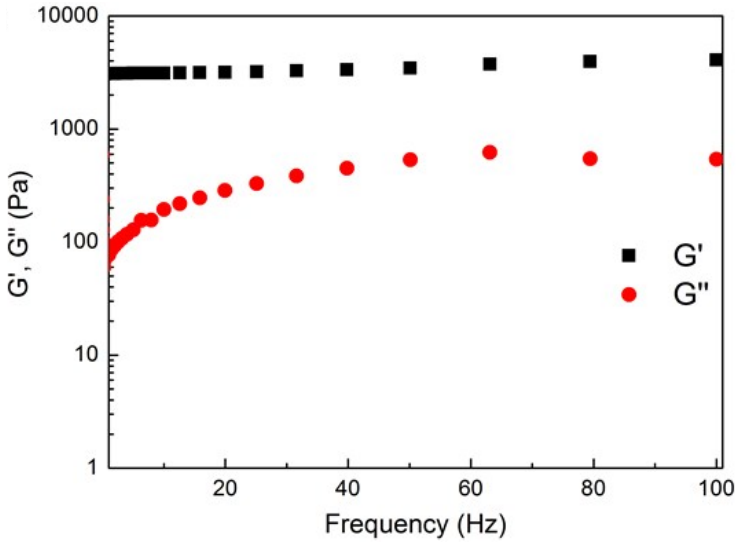

Figure S4. Rheological behavior of a 83% w/w hydrogel. Evolution of G' (squares) G'' (circles) as function of frequency.

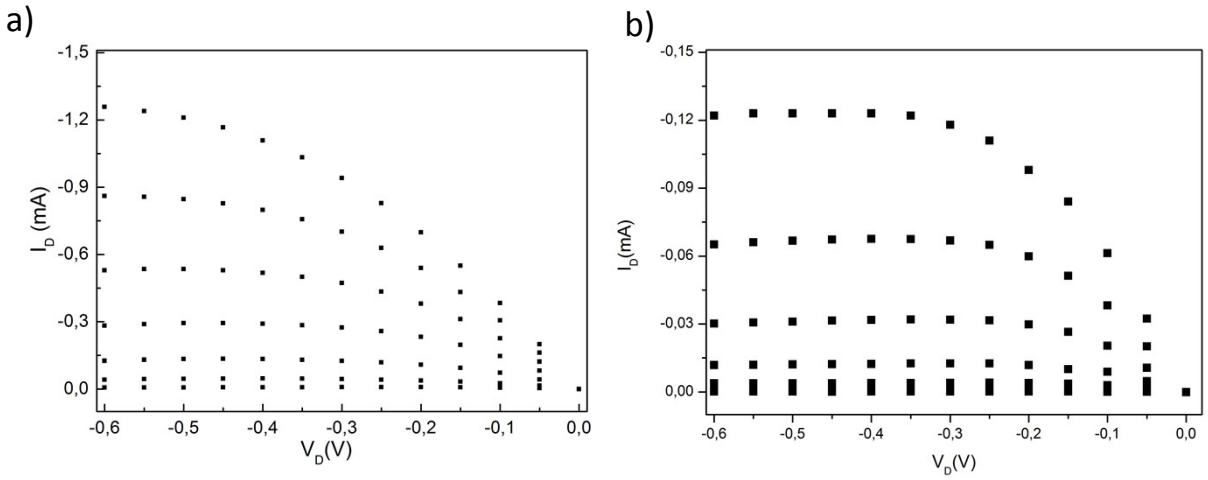

FIGURE S5. OECT IV output characteristics with the hydrogel and an aqueous NaCl 0.1M as electrolytes. (a) hydrogel IV output characteristics over the range of V_G=0 V to 0.6 V, with a V_G step size of 0.05 V, (b) NaCl 0.1M solution IV output characteristics over the range of V_G=0 V to 0.6 V, with a V_G step size of 0.05 V.