# The influence of DMSO on PVA/PVDF Hydrogel Properties: From materials to sensors applications

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## Supporting Information

***Hydrogel Preparation***

Table S1 reports the preparative conditions used to prepare the different PVA/PVDF based hydrogel in DMSO solvent

**Table S1**. PVA/PVDF hydrogel preparative conditions

| **PVA/PVDF** | **5:5** | **8:2** | **10:0** |
|---|---|---|---|
| **PVA** | 0.917 g | 1.467 g | 1.833 g |
| **PVDF** | 0.917 g | 0.367 g | 0 g |
| **DMSO for PVA** | 7.5 mL | 12.0 mL | 15.0 mL |
| **DMSO for PVDF** | 7.5 mL | 3.0 mL | 0 mL |

***Electrochemical Characterization***

Electrochemical Impedance spectrometry measurements were performed using an Autolab GSTAT128 N potentiostat/galvanostat (Metrohm-Autolab) controlled by NOVA 2.10 software. A Swagelok-type cell with 316 stainless steel electrodes of 1.0 cm in diameter, connected to the working electrode and the reference electrode to the two poles was used (Figure S3). EIS measurements were conducted at room temperature, with an alternating voltage amplitude of 10 mV and in a frequency range of 0.01 to $10^5$ Hz. Equivalent circuits were obtained using the NOVA analysis program.

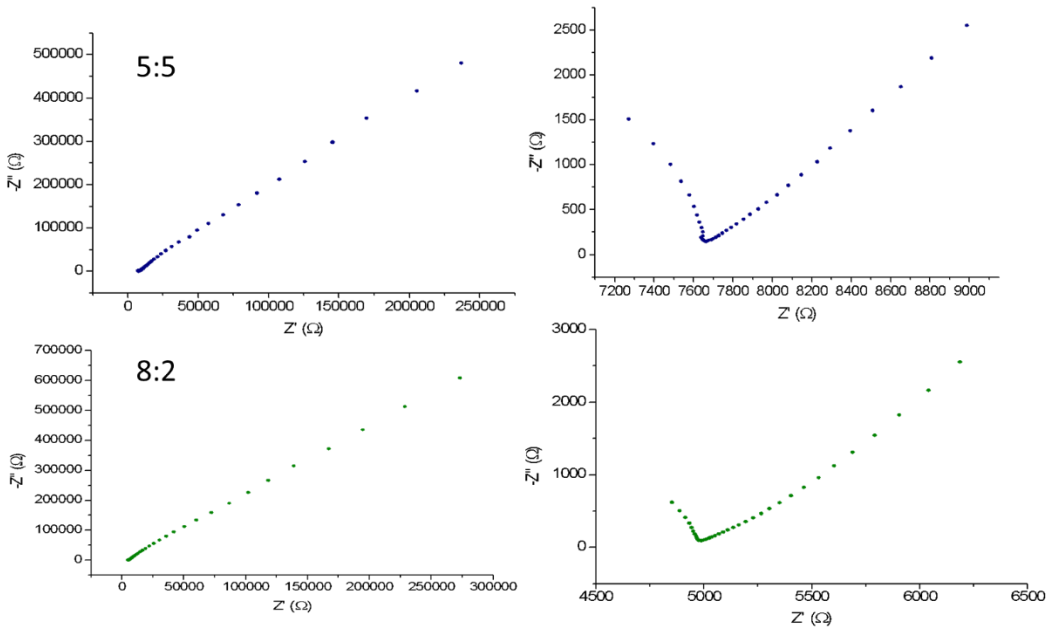


**Figure S1** Nyquist plot obtained with 8:2 and 5:5 hydrogel

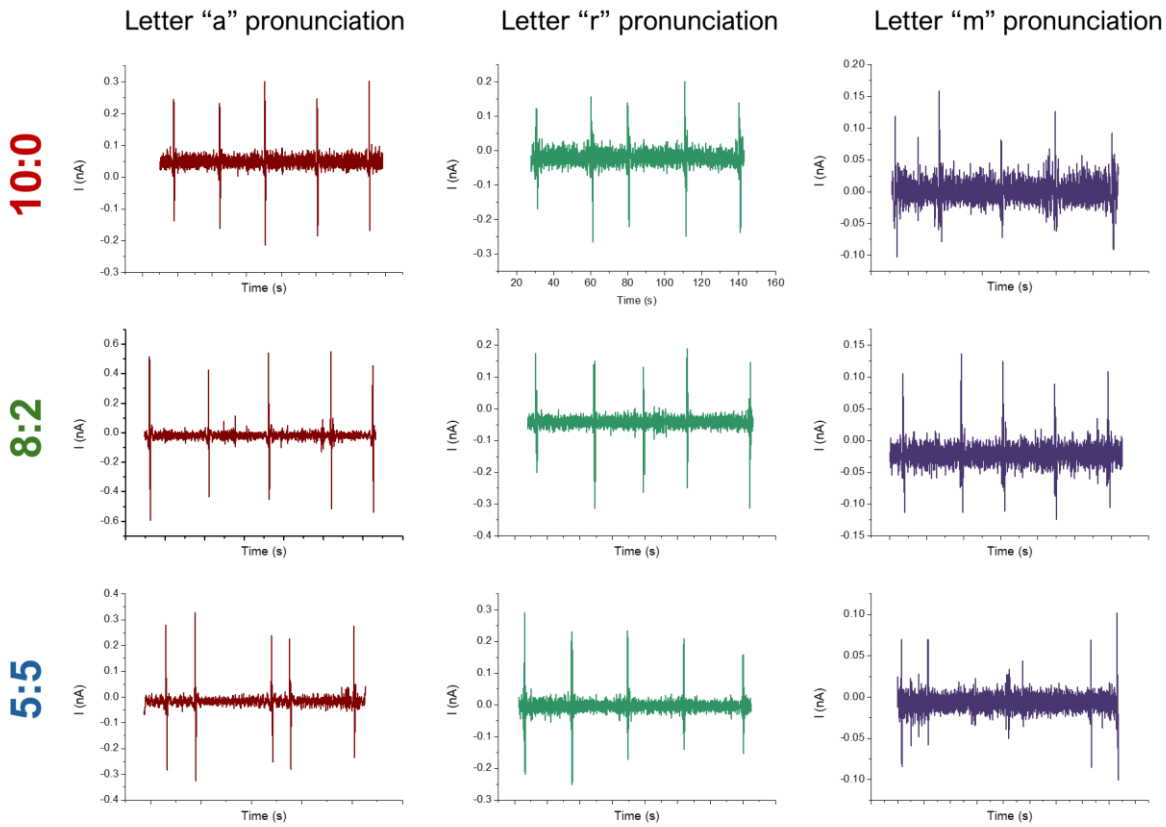


**Figure S2** Comparison of current vs time signal for letters “a”, “r” and “m”, obtained with sensors 5:5, 8:2 and 10:0

**Table S2.** Recent advanced materials used in sensor applications

| **Materials** | **Application** | **Mechanism** | **Ref** |
|---|---|---|---|
| Poly(vinyl alcohol)/Polyvinylidene fluoride hydrogel (PVA/PVDF Hydrogel) | Wearable pressure sensor | Triboelectric | This work |
| Carbon nanotubes + polyethyleneimine (CNT+PEI) and velvet or Polytetrafluoroethylene (PTFE) | Flexible pressure sensors | Triboelectric | [40][47] |
| Graphite coated with alumina and PTFE nanoparticles | Acoustic sensor | Triboelectric | [48] |
| Poly(vinyl alcohol)/Polyvinylidene fluoride fiber membrane (PVA/PVDF) | Energy harvesting and wearable sensors | Piezoelectric | [30] [49] |
| Polyacrylonitrile hydrogel incorporating ferroelectric poly(vinylidene fluoride) (PAN-PVDF) | Artificial Skin | Piezoelectric | [50] |
| PDMS fiber with rGO layer and Ag nanoparticle layer | Acoustic and strain sensors | Resistive | [51] |
| Triple-network (TN) cellulose nanofiber hydrogels | Wearable Electronics | Resistive | [52] |
| Noncracking vertically aligned gold nanowire (V-AuNW) films | Acoustic sensor | Resistive | [53] |

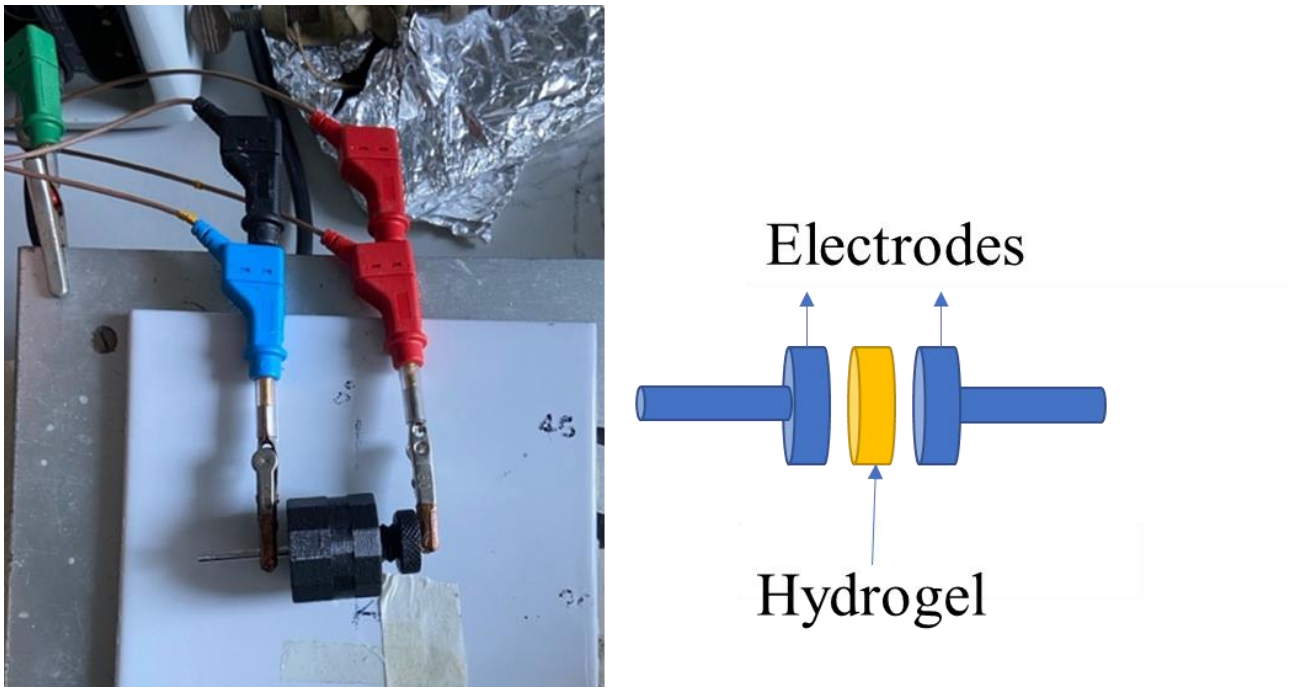


**Figure S3.** Experimental setup of the Swagelok cell (left) and scheme of the electrode and hydrogel assempbly (right)