# Encapsulation of (PT–Lap)/PAAm Hydrogels for Reliable Electrochemical Measurements for Wearable Electronics

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(PT–Lap)/PAAm physical hydrogels are used due to their unique combination of electrochemical conductivity, mechanical flexibility, and structural stability, while closely mimicking biological tissues, making them highly suitable for biolectronic and flexible electronic devices [1], [2]. Their composite structure where the PAAm chains are linked by the (PT-Lap) cubosomes enables high stretchability, robustness, and ionic conductivity, while providing a relevant platform to study electrochemical interactions ans environmental effects [3], [8], [9].
However these hydrogels exhibits strong dependence on environmental conditions. Their High water content makes them prône to evaporation, leading to conductivity instability and poor reproductibility of measurements [4], [5]. In addition, their non-ohmic electrochemical behavior and mechanical aging furthercomplicate their characterization [5].
In this context, encapsulation becomes essential to stabilize their properties by limiting deshydratation and improving measurement reliability [5]. A Kapton based encapsulation is well suited for experimental characterization ldue to itys chemical stability and electrical compatibility [6]. However its limited flexibility restricts its use in real-world applications. Alternatively, elastomers such as PDMS (polydimethylsiloxane) provide a more flexible and stechable encapsulation, better suited for biolectronic systems while maintaining effective environmental protection [3], [7].
Electrical characterization will include time-dependent conductivity measurements, and charge–discharge experiments to evaluate stability, ionic transport, and electrochemical performance [9].
Work is in progress in order to gather more data and help in understanding the conditions in forming such complex and interesting smart assemblies for suitable electronic devices.

**Keywords:**
hydrogels, bioelectronics, flexible electronic devices, sensors, soft conductive materials

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