



Electrochemical and spectroscopic investigation on the stability of poly ortho-aminophenol (PoAP), grown as a very thin membrane on platinum, under prolonged immersion in water



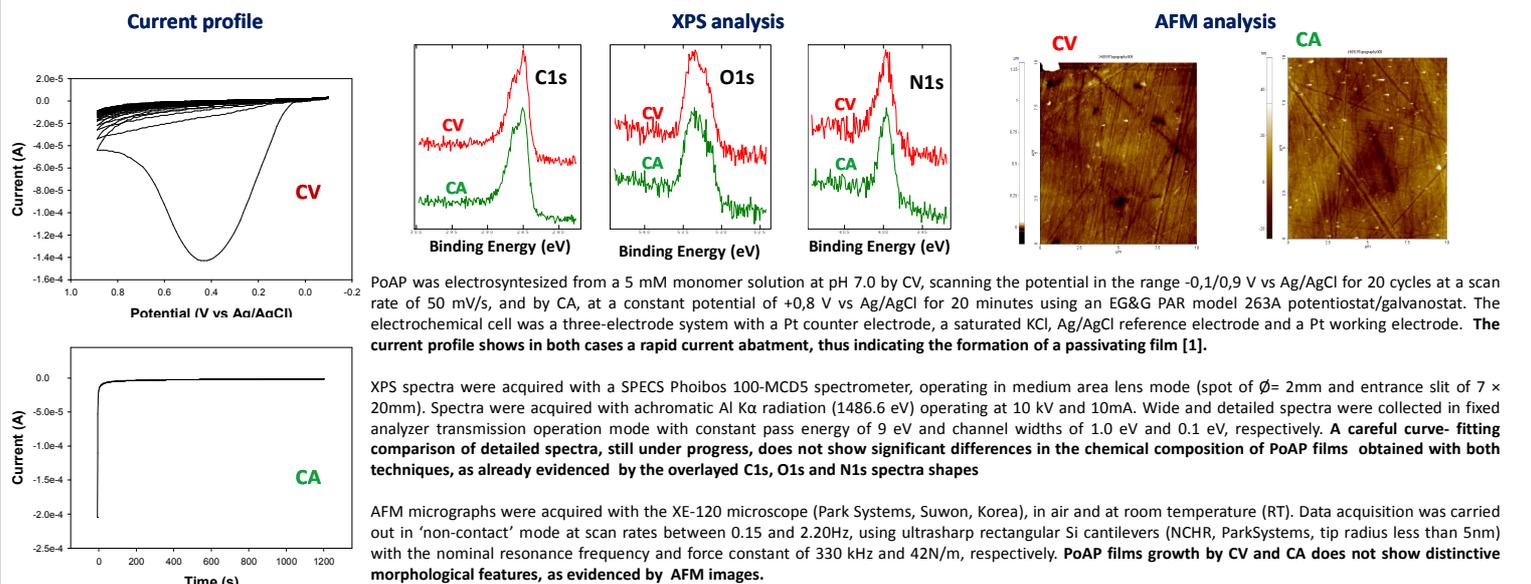
† R.I.P. 4 February 2018

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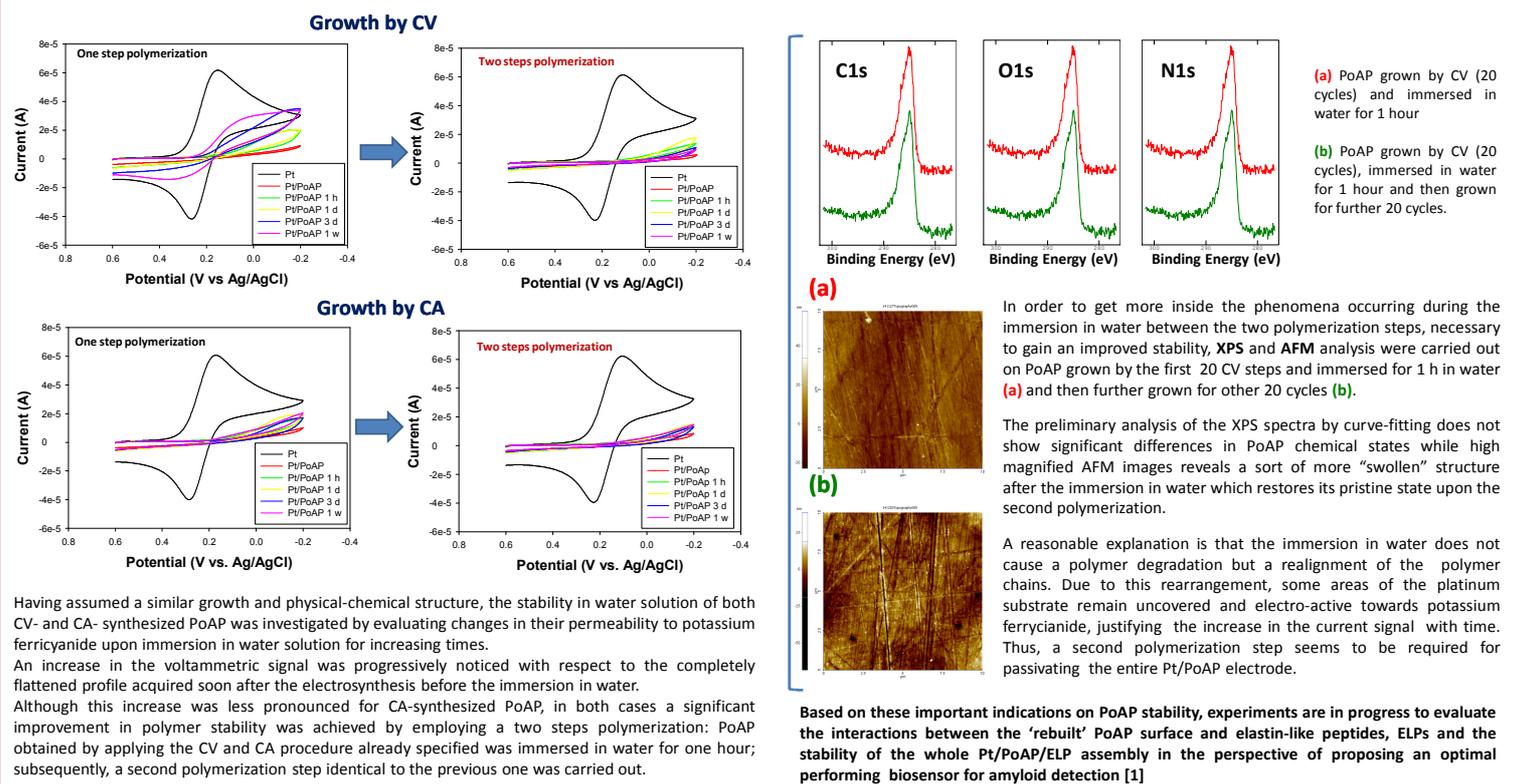
INTRODUCTION

- We have recently reported on the use of the modified electrode Pt/PoAP [1] as biosensor for amyloidogenic peptides, particularly performing when "recognizer" peptides are firmly entrapped within PoAP chains during electrosynthesis. The synthesis steps of this 2D MIP-inspired biosensor, using an elastin-like peptide, ELP, as a self-similar receptor of amyloidogenic peptides, having the same repeat sequence, VGGVG, are schematized in the graphical abstract of reference 1.
- The stability of PoAP membrane is thus crucial for the biosensor efficiency, considering the prolonged immersion of the Pt/PoAP/ELP system into the aqueous suspension of amyloids.
- At first, in this contribution we have investigated on the stability of "as prepared" Pt/PoAP systems that are produced, in neutral media, either by CV and potentiostatic growth of an insulating PoAP membrane, ultrathin and strongly adherent to the underneath platinum.
- The inertness of the membrane, acting as impermeable protecting barrier to electrodes poisoning, was monitored after increasing time of residence in water, using ferrocyanide as electrochemical probe having a well-known redox activity on platinum at the given potential range.
- Results from in situ electroanalysis and ex situ investigation by XPS and AFM techniques are provided which unequivocally show the importance of the post characterization of these layered electro synthesized systems, after periodic "resting and working" hours, in order to better control the process optimization, particularly, in view of bio-application with the more complex Pt/PoAP/ELP system.

POAP ELECTROSYNTHESIS BY CV(CYCLIC VOLTAMMETRY) AND CA (CHRONOAMPEROMETRY) TECHNIQUES



POAP STABILITY UPON PROLONGED IMMERSION IN WATER SOLUTIONS



REFERENCES

- [1] MariaElvira Carbone, Rosanna Ciriello, Pasquale Moscarelli, Federica Borsari, Giuliana Bianco, Antonio Guerrieri, Brigida Bochicchio, Antonietta Pepe, Daniela Quaglini, Anna Maria Salvi ' *Interaction between elastin-like peptides and an insulating poly (ortho-aminophenol) membrane investigated by AFM and XPS* Analytical and Bioanalytical Chemistry (2018) 410: 4925-4941 and related references therein cited