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**Electrosynthesis of polypyrrole nano/micro structures using an electrogenerated oriented polypyrrole nanowire array as framework.**

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**Abstract**

The purpose of this paper is to show that it is possible to increase the diameter and the length of the nanostructures of a framework formed of oriented polypyrrole nanowires that has been prepared by a templateless electrochemical method based on the use of a pyrrole solution containing a high concentration of weak-acid anion and a low concentration of non-acidic anion. The dimensions of the initial nanowires are increased by performing an additional electrosynthesis in a 'classical' monomer solution. Depending on the polarization time of this last synthesis (a few tens of seconds), wires with various diameters, from one hundred up to several hundred nanometers, are obtained. In addition to the variation of the nanowire size, these findings confirm, as outlined in the reaction mechanism we have proposed, that the base of the nanowires is surrounded by a thin non-conductive polymer *i.e.* by an overoxidized polypyrrole film. Actually this paper shows a proof-of-concept. Indeed one can imagine that the second polymeric electrodeposit could be performed using an organic monomer solution, using functionalized pyrrole monomer to fabricate a biosensor having large specific area, and/or using anions which could be drugs.

**Keywords**

Polypyrrole, nanostructures, nanowire, microstructure, electrochemical synthesis

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