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PAPER: A NOVEL MULTI-TASKING RESOURCE IN ANALYTICAL CHEMISTRY

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The growth of (bio)sensors in analytical chemistry is mainly attributable to the possibility of realizing smart platforms, which are affordable, effective, portable and user-friendly. Among the various strategies to develop these devices, the electroanalysis is gaining a leader position in the development and commercialization of analytical devices: it is mainly dependent on the operational simplicity and on the absence of interferences due to colored/turbid solutions (which limits colorimetric tests). Worldwide, blood-glucometer is the most sold example of an easy-to-use device and it represents ca. 90% of the entire biosensors global market [1]. Cooperation of diverse disciplines such as chemistry, biology, material science, and engineering, is pushing electroanalytical methods towards the realization of low-cost, remarkable sensitivity and low-requirement devices. In particular, paper-based devices are always more gaining a relevant position in the field of sensors. The continuous demand for affordable, simple, sustainable, and portable devices, is making paper as the ideal basis towards the realization of analytical tools for the easy self-testing. However, the possibilities around the use of paper are not limited to its use as an alternative substrate in strips fabrication (instead of plastic-based). The active role of paper, in particular the filter one, is extended towards i) the loading of the reagents to make an assay reagent-free, ii) the filtering of the gross impurities in complex matrices, iii) the manufacturing of 2D and 3D architectures, and iv) the synthesis of nanoparticles for sensing application. Many examples that highlight the features of paper-based substrates for sensing applications within the environmental and clinical fields are presented.