OR32

Synthesis and characterization of molecularly imprinted based sensors for food contaminants detection

Marlene Valentino[1,*], Paolo Bollella[1,2], Flavio Della Pelle[4], Dario Compagnone[4], Nicoletta Ditaranto[1], Luisa Torsi[1,2,3]

[1]Dipartimento di Chimica, Università degli Studi di Bari "Aldo Moro", 70125 Bari (Italy).
[2]Centre for Colloid and Surface Science - Università degli Studi di Bari "Aldo Moro" 70125, Bari (Italy).
[3]Faculty of Science and Engineering, Åbo Akademi University, 20500 Turku (Finland).
[4]Faculty of Biosciences and Technologies for Food, Agriculture and Environment, University of Teramo, via R. Balzarini 1, 64100 Teramo, Italy
marlene.valentino@uniba.it

Recently, molecular imprinted polymers (MIPs) played an important role in the development of reliable and stable sensors, considering the biomimicking nature of this platform with respect to several biorecognition elements like antibodies, DNA or enzymes, for instance enclosing nanomaterials as nanozymes.[1,2] MIPs are synthesised through a polymerization method to create semi-specific positions for targets in the molecular dimensions by using a monomer (*e.g.*, *o*-phenylenediamine, pyrrole *etc.*) and a target molecule.[3,4] In this work, we develop a MIP based electrode to sense dimethoate at ultralow/traces concentrations by using first electrochemical methods and later including this platform in an electrolyte-gated organic field effect transistor (EGOFET). At first, we characterised the modified platform by using several electrochemical techniques to demonstrate the effective removal of the templating molecule and the possibility to perform the rebinding/washing step multiple times, hence proving the stability of the prepared electrode surface. Furthermore, we performed a spectroscopic characterisation of the modified surface by means of X-Ray Photoelectron Spectroscopy (XPS) to prove the efficient template removal. Finally, the platform was also used to perform preliminary sensing measurements.

References

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