Design and development of an electrochemical sensing device for heavy metals detection

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Abstract

Heavy metals are among the main causes of water pollution. They can enter water supply mostly by industrial liquid waste, determining high risk for both the human and the environmental health. Indeed, heavy metals are dangerous since their bioaccumulation can cause important diseases, such as dysfunction of the central nervous system and damage to the blood composition.

Several methods for the detection of heavy metals in water have been developed and many of them are expensive and generally require long time analysis. In these regards, electrochemical impedance spectroscopy (EIS) could be an alternative measurement technique. Moreover, it could be easily incorporated in low-cost sensors for trace metal analysis.

The present work is focused on the development of a portable electrochemical sensing device for the detection of heavy metals in water, able to capture in a highly efficient, selective and not reversible way metallic ions. Therefore, electrochemical techniques combined with electrospun nanofibers has been envisaged as a valid solution. As known, nanofibers are characterized by outstanding properties, such as high porosity, low density and large surface area to volume ratio, making them a suitable substrate for sensing applications.

Biography:

Antonio Fotia was born in Reggio Calabria, Italy in 1993. He received the M.S. degree in Environmental and Territorial Engineering from University of Reggio Calabria. Actually, he is Ph.D. student at the University of Reggio Calabria, and his research interests include the development, the synthesis and the characterization of nanostructured materials for energy and sensing applications and the development of portable instrument for test sensing.

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