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ELECTROCHEMICAL DETECTION OF FLUOXETINE IN WATER USING A SILVER MODIFIED ZEOLITE-CARBON NANOFIBER ELECTRODE

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Abstract

Pharmaceuticals contaminants in waters exhibit a significant threat on the human health and the ecosystem quality. This research demonstrates the utility of a silver-doped zeolite-modified carbon nanofiber-epoxy (AgZ-CNF) prepared by two-roll mill method in development of the fast methodology for the detection of fluoxetine (FXT) in the aqueous solution. The results showed the role of zeolite that improved the sensitivity and the limit of detection of FXT resulted to the possibility to propose a specific preconcentration-based detection protocol. The silver contributed to decreasing the anodic over potential for FXT oxidation and hence, for FXT detection. The best sensitivity of 2.007 μA μM-1 and lowest limit of detection of 19 nM are were obtained for preconcentration-cyclic voltammetry based scheme, which is very promising for the detection of FXT at trace levels. Also, the chronoamperometry operated at 0.350 V/SCE specific to silver involving and +1.1V/SCE characteristics to the carbon nanofiber, allowed FXT detection in the aqueous solution. The long life time and the stable response for FXT detection was found for AgZ-CNF composite electrode, which suggests its practical utility in FXT determination in the real water sources.

Key words: carbon nanofibers based electrode, electrochemical detection, fluoxetine, silver doped zeolite, zeolite-modified electrode

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