Electrochemical detection of azithromycin based on modified carbon paste electrode

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Abstract

Antibiotics are widely used today to treat many antibacterial diseases. They are often discharged into the environment in an uncontrolled mode, risking pollution of aquatic habitats. Determinations with sophisticated instrumental methods of these analyte often require time and high costs. In this paper, is studied the possibility of developing a sensor to determine by electrochemical methods the antibiotic azithromycin, which is used the most compare with other antibiotics. The sensor is based on carbon pastes and suitable nanomaterial modifier, ZnO, reducing the detection limit and analysis time and increasing the selectivity. Characterization of modified carbon paste using electrochemical characterization techniques explain the presence of these modifiers. From the assessment of the performance parameters of the sensors, the modifier ZnO by 16% (wt/wt) and 10% (wt/wt) of graphene oxide in the carbon paste, gives the best results, with a correlation coefficient according to Regression Analysis, $R^2 > 0.9$ of the calibration curve.

References

[1] Patil, V. et al., Bioengineering 2022, 9, 521.
[2] Neethu S. et al., Inorg. Chem. Front., 2019
[3] Azizallah A. et al., Anal. Methods, 2021, 13, 910

Figures

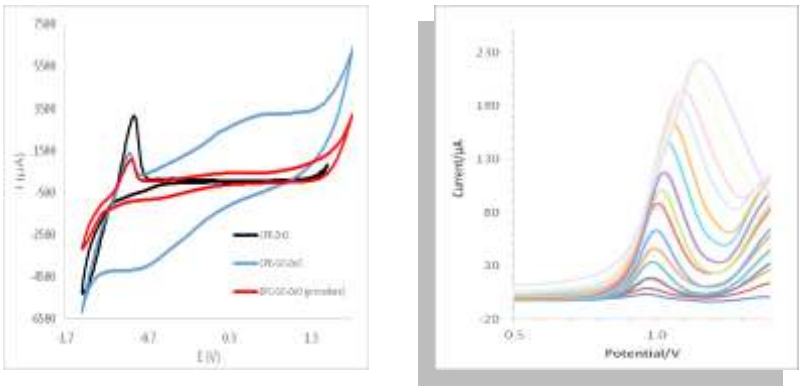

Figure 1: Voltammograms of CV (left-E=1.5:-1.5 V) for three types of modified electrode in acetate puffer, pH 5; and Voltammograms of DPV (right- E=1-1.8 V, teq=10 s, scan rate=0.05v/s) for CPE modified with graphene oxide and ZnO, in different concentration of AZI.