Rapid and sensitive detection of methotrexate using acetylene black electrode

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A glassy carbon electrode sensor modified with acetylene black (AB) film was fabricated and successfully used in detecting methotrexate (MTX) in real clinical samples. In this study, a homogeneous suspension was obtained by ultrasonically dispersing AB into water for 1 h. The performance of the prepared sensor was studied via cyclic voltammetry. The prepared electrochemical sensor exhibited a good linear relationship within the range of 0.005 μM to 3.0 μM , and the detection limit for MTX was 3.81 nM. The sensor also demonstrated satisfactory selectivity, repeatability, and stability for MTX determination. Thus, a practical platform for detecting MTX in clinical samples is proposed.

Keywords: Methotrexate; Acetylene black; Electrochemical sensor

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