Preparation of a Cu-MOF as an Electrode Modifier for the Determination of Carbendazim in Water

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Using a hydrothermal technique, the present study demonstrated the synthesis of a Cu metal–organic framework (Cu-MOF), [Cu(adp)(BIB)(H₂O)]_n (BIB = 1,4-bisimidazolebenzene; H₂adp = adipic acid). Carbendazim was successfully detected by an ultra-sensitive and facile electrochemical sensor fabricated based on the [Cu(adp)(BIB)(H₂O)]_n-coated GCE via differential pulse voltammetry. The present study employed [Fe(CN)₆]^{3-/4-} as an electrochemical probe to investigate the electrochemical properties of our developed sensor. The charge transfer rate and electrode surface of the [Cu(adp)(BIB)(H₂O)]_n/GCE were both more favourable compared to those of the bare GCE. Cyclic voltammetry results suggested a desirable electrochemical performance of our developed sensor towards the detection of carbendazim. Our developed sensor was excellent towards the electrochemical oxidation of the analyte. In addition, the as-prepared electrochemical sensor showed great potential for the detection of carbendazim in water samples.

Keywords: Cu-MOF; Carbendazim; Water sample; Electrochemical determination; [Cu(adp)(BIB)(H₂O)]_n/GCE

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