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DETERMINATION OF ORGANIC POLLUTANTS FROM WATER BY ELECTROCHEMICAL METHODS

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Abstract

Water quality management usually engages monitoring a series of key contaminants that are considered as indicators of acceptability for an explicit use. An important pollutant class for water monitoring is organics, usually expressed as conventional overall COD (chemical oxygen demand) parameter. However, the identification of organics is not allowed by COD parameter, and electrochemical techniques using suitable electrode materials can be employed to reach this task. In this work, boron-doped diamond (BDD) electrode was used for detection of some electrochemically oxidable organics conventionally considered responsible in COD parameter evaluation, i.e., oxalic acid and 4-chlorophenol. The electrochemical behaviors of oxalic acid and 4-chlorophenol on BDD electrode were studied envisaging its individual and simultaneous detection in aqueous solution. Optimum detection conditions were determined based on the electrochemical techniques used, i.e., cyclic-voltammetry (CV), linear-scan voltammetry (LSV), differential pulsed voltammetry (DPV) and chronoamperometry (CA), in relation with the electroanalytical parameters (concentration range, sensitivity, stability, reproducibility and the lowest limit of detection). BDD electrode exhibited suitable characteristics for both individual and simultaneous detection of 4-chlorophenol and oxalic acid from water.

Key words: 4-chlorophenol, boron-doped diamond, oxalic acid, simultaneous detection

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