Abstract

Non-Enzymatic Analysis of Cholesterol in Acetonitrile Solution on Different Electrodes

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Cholesterol is an essential element that is required by the human body in order to function properly. Just the right amount of cholesterol is needed by the human body, since insufficient and excessive cholesterol levels may lead to different health problems. This research was conducted to analyze non-enzymatic electrochemical behavior of cholesterol, such as indirect cholesterol oxidation as it may cause health diseases and for the development of possible detection methods of cholesterol.

The results showed that based on the analysis by using cyclic voltammetry, the platinum Pt and glassy carbon (Gc) electrodes were able to detect the cholesterol with a concentration range of 0.0062 - 0.0759 mM contained in acetonitrile solution along with potassium bromide (KBr) and tetrabutylammonium hexafluorophosphate (NBu_4PF_6). The detection limit of platinum and glassy carbon electrodes towards indirect oxidation of cholesterol was 17.0 µM and 9.85 µM respectively. The results of the detection limit of electrodes used in this research appear to be substantially better compared to those that utilize cholesterol oxidase reported in the literature, however it performed poorer in comparison to the similar electrode material reported in the literature. Therefore, further research and improvement was needed in order to develop a higher detection ability towards indirect oxidation of cholesterol.

Keywords: *Cholesterol, Indirect cholesterol oxidation, Cyclic Voltammetry, Electrodes, Detection limit*