



University of Belgrade, Technical Faculty in Bor
29th International Conference Ecological Truth
& Environmental Research



EcoTER'22

Proceedings



Editor

Prof. Dr Snežana Šerbula

21-24 June 2022, Hotel Sunce, Sokobanja, Serbia



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TESTING THE ELECTROCHEMICAL BEHAVIOR OF BPA ON GC, WO₃ AND MWCNT ELECTRODES

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Abstract

Bisphenol A (BPA) is an organic compound used in large scale at the plastics industry and as a precursor in the synthesis of polycarbonates and epoxy resins, which lead to frequent detections of BPA in surface waters. Therefore, it is necessary to develop and improve methods for BPA detection and monitoring. The electrochemical behavior of Bisphenol A at WO₃ and carbon-based electrodes, like glassy carbon (GC) and multi-walled carbon nanotubes (MWCNT), were compared using cyclic voltammetry (CV). Therefore, WO₃ nanoparticles were obtained by hydrothermal method and characterization was done using XRDP. The results showed that the responses of the WO₃ electrode were 30 times larger compared to another examined electrode. This implies that WO₃ electrode can be useful for the detection BPA in nature media.

Keywords: BPA, GC, WO₃, MWCNT, electrochemical

INTRODUCTION

Bisphenol A or 2,2'-bis (4-hydroxyphenyl) propane is a well-known chemical that causes endocrine disruption and shows hormone-like properties [1].

It is one of the most commonly used chemicals for the synthesizing of polycarbonate and epoxy resins which have being used for food storage, packaging and drinking cans [2]. Japan, the U.S. Environmental Protection Agency (USEPA), the European Union and the World Wildlife Fund (IMF), placed BPA on the list of priority pollutants [3]. Many researchers have been exploring the efficiency of electrochemical oxidation of BPA on anode materials such Ti/BDD, Ti/Sb–SnO₂, Ti/RuO₂, Ti/SnO₂, Ti/PbO₂ and Ti/Pt [4].

Glassy carbon has widespread application due to their cheap, simple and diverse surface modification. GC is impermeable to gas, electrically conductive and chemically inert material. In analytical laboratory glass carbon is the most commonly used electrode based on carbon. Although GC electrodes have favorable electrochemical characteristics, GC surface modifications have been the subject of research due to the many potential improvements of electrodes caused by different electrochemical requirements [5].