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Serbian Young Chemists' Club

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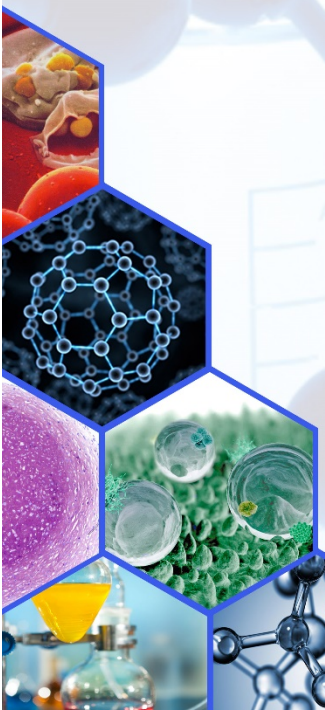

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HA15 PE 13

Evaluation of commercial bottled water quality from the health aspect

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The term bottled water means water packed in a health-correct packaging and available in the market for human consumption. Consumers still have insufficient knowledge of importance of the certain ingredients and their harmful or beneficial effect on the human organism. There is not enough expert information about the harmfulness of certain ingredients in the water, but many countries in the world have adopted legal regulations in which quality parameters of bottled water are standardized (EEC, WHO[1], EPA, IBWA, FDA). The race for profit and the lack of necessary quantities of bottled waters moved declarations in to the second plan. The declaration on bottled waters should describe also the physiological characteristics, since the consumption of high-mineral water may lead to adverse effects on the health of consumers, primarily children. In such declared water, missing physiological characteristics of water, redox statuses, and possible consequences on the health, are neglected due to excessive consumption of waters with high mineral content. Due to the increased content of mineral substances and high sodium intake, the allowed daily intake should be declared for water loaded with mineral substances. Redox status of water represents a health factor and it is completely defined by the pH value, redox potential and rH_2 factor, parameters which were the subject of this study in this work. The oxide-reduction potential of water, E_{ROX}, represents the mixed potential of all present redox pairs and directly affects the behavior of water relative to the agents to which comes into contact[2]. The results pointed to the necessity of a fuller declaration of bottled water, because in that case bottled water gained in importance and would decrease the consequences of the possible bad effects on health due to excessive consumption of water rich with minerals. Test results demonstrated that our market has a wide range of bottled waters, and that the health aspect can be estimated through the oxidation-reduction properties.

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NM10 PE 7

Innovative aproach for wireless electrochemical remediation of cyanotoxins based on bipolar electrochemistry

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Bipolar electrochemistry (BPE) is an unconventional method to address conducting and semiconducting particles in a wireless manner. Unique features of BPE when compared to conventional electrochemical setup where electrochemical reactions take place at the surface of two different electrodes both connected to a potentiostat, allow us to address bipolar electrode electrochemically in a wireless fashion because there is no direct connection with the power supply (see Figure 1.). Herein, we used the concept of BPE as a straightforward way for the site selective deposition of materials on bipolar electrodes. Furthermore, we use these materials for the electrochemical remediation of cyanotoxins, a potential global health problem, exploiting the versatility of bipolar electrochemistry. Due to the high toxicity of cyanotoxins, highly efficient remediation methods have been under development in recent years, with advanced oxidation processes focused on mineralization as major target. Electrochemical remediation arose as an interesting alternative with few reported protocols to date.

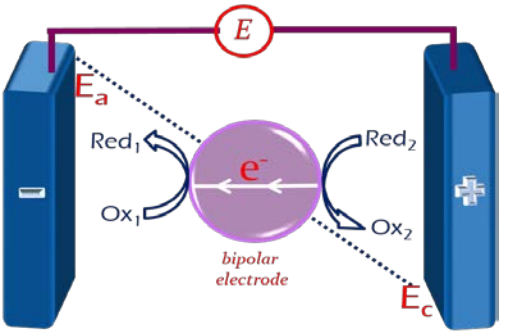

Figure 1. Schematic illustration of the principle of bipolar electrochemistry based on the polarization potential established alongside a conducting object immersed in an electrolyte and exposed to an electric field.

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