

Eco-Friendly Screen-Printed Electrochemical Sensor by Using Tapioca-Based Conductive Ink

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The use of conductive inks is essential in the manufacturing process of screen-printed electrodes, and the development of a new water-based ink has emerged as a sustainable and environmentally friendly alternative [1]. Along the same lines, the search for new sustainable materials is growing. Thus, biopolymers have been highlighted in their use in several areas of the industry due to their film-forming capabilities, low toxicity, biodegradability and relatively low cost [2], where we can highlight the starch present in tapioca as a binder to be used in the preparations of inks. Therefore, in this work, a new formulation of water-based conductive ink was developed, using tapioca, graphite and carbon black, which was applied to manufacturing disposable screen-printed electrodes. The devices were used to determine uric acid using the differential pulse voltammetry technique, in a linear range from 5.0 to 100 mmol L⁻¹ and limit of detection (LOD) = 0.34 mmol L⁻¹. These results indicate that both devices exhibit satisfactory analytical responses for electrochemical detection. Furthermore, the findings demonstrate that water-based conductive ink can be produced using starch, proving that more sustainable devices can be developed and applied in electrochemical determinations.

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References

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