Electrochemical Determination of Bisphenol A in Saliva by Novel Three-Dimensional (3D) Printed Gold-Reduced Graphene Oxide (rGO) Composite Paste Electrode.

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Abstract

A novel synthesised gold (Au)-reduced graphene oxide composite (rGO) is used for fabrication of an electroactive paste inserted in a three-dimensional (3D)-printed platform for the determination of bisphenol A (BPA). The proposed method exhibits a good response towards oxidation of BPA in the linear concentration range from 1.00 x 10^{-7} mol L^{-1} to 1.00 x 10^{-2} mol L^{-1}. The Au-rGO based 3D-printed platform was able to detect BPA with a detection limit of 3.52 x 10^{-9} mol L^{-1}, in comparison with rGO based 3D-printed platform, where the limit of detection was 3.05x10^{-6} mol L^{-1}. Gold modification of rGO improves the sensitivity and electrochemical behaviour of the proposed material for BPA oxidation. The method was validated using five saliva samples collected from children.

Keywords— *bisphenol A (BPA), differential pulse voltammetry (DPV), reduced graphene oxide (rGO), three-dimensional (3D) printing*

Professional Biography (100-150 words)

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