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Defects regulating of graphene ink for electrochemical determination of ascorbic acid, dopamine and uric acid

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Abstract:

A simple water immersing treatment has been established for regulating the electrocatalytic activity of commercial graphene ink. This process enables to remove additives in graphene ink and consequently expose the surface defects. A graphene ink coated glass has been fabricated as an example platform for simultaneous determination of ascorbic acid (AA), dopamine (DA), and uric acid (UA). Cyclic voltammetry studied indicated electrocatalytic reaction can be initiated after the additives leaching during the water immersing treatment. Under optimal conditions, the linear calibration curves were achieved in the range of 50 to 1000, 3 to 140, and 0.5 to 150 μ M, with detection limits of 17.8, 1.44 and 0.29 μ M for AA, DA, and UA, respectively. This work demonstrated that the removal of additives of the graphene ink after film coating could be applied as a simple and cost-effective electrochemical platform for sensing application.

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