

Separation and detection of antioxidants using a graphene-based electrochemical sensor platform

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Abstract

CVD-Graphene is ideally suited as an active element for electrical and electrochemical sensing platforms, since it provides for high sensitivity and low detection limit. [1] Electrochemical sensors provide a simple way to measure analytes in fluids with high sensitivity without the need for complex instrumentation. Due to these aspects, graphene sensors are interesting for a wide range of applications in bio analytics. Antioxidants are natural or synthetic compounds, which inhibit oxidation processes and hence often find use as preservatives. It has been suggested that the long-term consumption of diets rich in antioxidants is associated with a lower risk of developing diseases linked to oxidative stress. Gallic acid and ascorbic acid are representatives of antioxidants. [2] We have developed a graphene-based sensor platform to separate and subsequently detect antioxidants. Graphene exhibits low detection limits for ascorbic acid and polyphenols. [3,4] In this study, the sensing of gallic acid and ascorbic acid on bare CVD graphene in various solvents was investigated by Square Wave Voltammetry. Furthermore, the separation and detection of the bioanalytes by deploying different membranes were evaluated.

References

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