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## Synthesis of graphene/ZnO nanowire arrays/graphene foam and its application for determination of folic acid

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### Abstract

Graphene foam (GF) was synthesized by chemical vapor deposition (CVD) using nickel foam as the template. Then, ZnO nanowire arrays (ZnO NWAs) were grown on the GF by hydrothermal synthesis. Finally, graphene (Gr) was deposited on the ZnO NWAs by CVD to obtain the hybrid of Gr/ZnO NWAs/GF. Due to large specific surface area and outstanding electric conductivity, the hybrid can be used for the determination of folic acid (FA) by cyclic voltammetry and differential pulse voltammetry. The results show that ZnO NWAs are uniformly and vertically grown on the GF and Gr is deposited on the ZnO NWAs. The sensitivity and the measured detection limit of the hybrid for FA in the range of 0-60  $\mu\text{M}$  are  $0.18 \mu\text{A} \cdot \mu\text{M}^{-1}$  and 1  $\mu\text{M}$ , respectively. The hybrid can accurately detect FA in the presence of uric acid, and the hybrid also shows good reproducibility and stability.

**Keywords:** Graphene foam, ZnO nanowire arrays, Biosensor, Folic acid, Uric acid

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