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## A Novel Graphene-based Tapered Optical Fiber Sensor for Glucose Detection

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### Abstract

In this study, a novel tapered plastic optical fiber sensor based on the single-layer graphene film is demonstrated. A single-layer graphene film was grown on copper foil by chemical vapor deposition (CVD) and transferred to the cone area of the optical fiber by wetting transfer technology. The tapered plastic optical fiber was fabricated with waist diameters of 1mm and total lengths of 5cm. In order to increase the stability of the sensor, the taper regions were coated with a single-layer graphene with length of 1.5 cm. By using this platform, the glucose solution as the analyte was measured. The output light intensity and glucose concentration shows a reasonable linear relationship in the range of 1%~40%.

**Keywords:** graphene, tapered optical fiber sensor, glucose detection, evanescent field

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