

Biomolecular Detection Using Pyrene-Functionalized Graphene

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This paper describes our development of the graphene biosensors. When a specific biomolecule is combined with a specific functionalized molecule on the surface of the graphene, the amount of biomolecule is quantitatively detected by measuring the amount of current change of the electrode. Compared with the traditional method, the graphene biosensor has real-time performance and can directly convert biological signals into electrical signals, reducing signal transmission. At the same time, we are also developing a portable device that allows the stone-milled biosensor to be able to detect biomolecules at anytime and anywhere in the future, just like a mobile phone.

Graphene is an ideal two-dimensional material with a high specific surface area. This allows it to combine more biomolecules. At the same time, by changing the Fermi level of the graphene, its carrier concentration can be regulated, thereby affecting the conductivity of the graphene; therefore, graphene can be used as a biosensor.

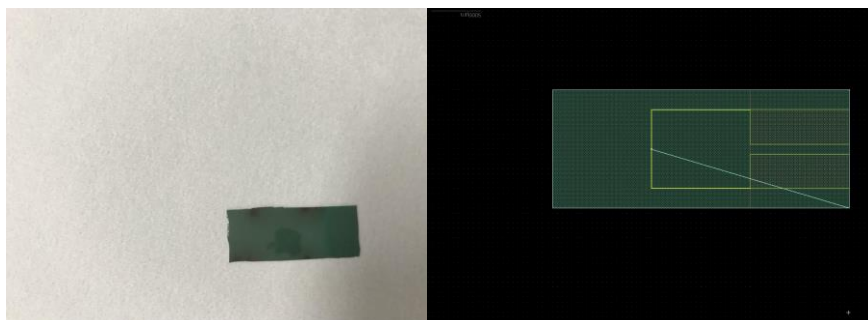


Fig. 1 SiC graphene

Fig. 2 Electrode shape

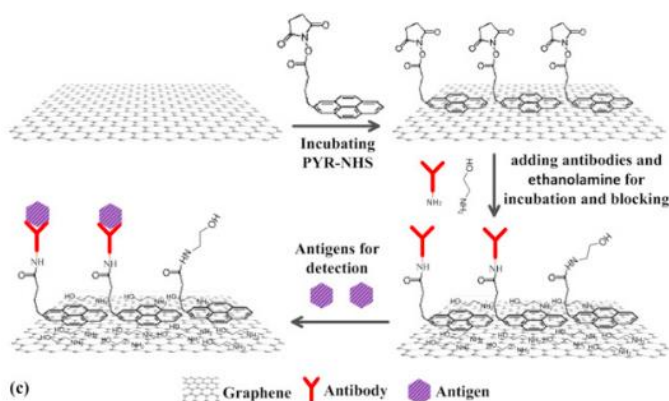


Fig. 3 Bio-modification



Fig. 4 Portable testing equipment

¹ Zhou, Lin, et al. "Label-free graphene biosensor targeting cancer molecules based on non-covalent modification." *Biosensors and Bioelectronics* 87 (2017): 701-707.