

Novel carbon based materials for electrochemical biosensors

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Abstract:

To find a easy and early cost effective diagnosis method is a problem towards many diseases and certainly an accurate and cheaper diagnosis technique can help to reduce the health care cost to a large extent. Biosensors belong to a class of major diagnostic device at the present era that plays significant role in this regard to provide unique detection and measurement of various biomarkers for different diseases resulting in better patient management and care.

In order to obtain the biosensor with the necessary sensitivity and selectivity, in this work we proposed nanohybride materials with unique catalyst system. This nanohybride materials integrates carbon nanotube (CNT), carbon nanofiber and metallic nano-particle catalysts or a redox mediator such as methylene blue[1]. This carbon based supporting materials have enhanced surface area of the working electrode of an electrochemical-based biosensor, consequently, increased the sensitivity of the biosensor and with metallic nano-particle catalysts or with redox mediator molecule it provided the needed selectivity for the biosensor.

Here a sheet of carbon nanotube (CNT bucky paper) [2, 3] has been formed with gold nanoparticles[4,5] by different techniques and also CNT buckypaper has been modified with methylene blue. These engineered CNT based electrode could detect an essential amino acid tryptophan[4] and cardiac marker, myoglobin [1].

References:

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