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Development of 3rd generation alcohol oxidase based biosensors for detection of alcohol using multiwalled carbon nanotube as electroactive matrix for direct tunneling of electron transfer

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The rapid detection of alcohol is one of the most important analysis in clinical diagnostics and fermentation industry. Both Alcohol dehydrogenase(ADH) and Alcohol Oxidase(AOx) are used for alcohol detection. ADH has the disadvantage to be dependent on dissolved coenzyme NAD+ which has to be added to the assay. But in case of AOx redox active centre FAD is bounded to the protein matrix, no need to supply externally.In the previous reported data on AOx very less work on AOx based biosensor has done.The use of the enzyme alcohol oxidase (AOX) on the analysis of alcohol in complex samples allows a considerable enhancement in specificity. This work is the state of the art on alcohol determination based on immobilized AOX on Au electrode using carbon nanotube and nafion(NF) is a electroactive matrix for alcohol oxidase. This fabricated bioelectrode was electrochemically characterized by using cyclic voltametry and chronoamperometry. The bioelectrode shows good and reliable response characterstics for ethanol with extended linear response range, optimum storage stability upto 20 days and exhibits a better tolerance to temperature changes.These results proved that the fabricated bioelectrode with MWCNT-NF offer optimum stability, reproducibility, repeatability towards the ethanol estimation and also has the potential as a bioanode for Biofuel cell application. Considering the above findings the constructed bioelectrode is envisaged to have potential application for biosensor application.

Referenecs

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