

# Biosensors-Mobilization and Immobilization GODx Catalyst in H<sub>2</sub>SO<sub>4</sub> and TiO<sub>2</sub> Bulk Solution

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**Abstract:** The Biosensor is emerging technology in the field of BIOTECHNOLOGY. Biosensor consists of three electrodes namely working electrode, Reference Electrode and Counter Electrode. It consists of 4 openings namely WE, RE, CE and fourth opening for bulk solution. The biosensor which I used is electrochemical type. Electrochemical biosensors are potentiometric, voltametric and Amperometric biosensors. The output of Amperometric biosensor is purely current order of milliamperes. The reaction gets speeded up with the usage of a catalyst. The usage of Catalyst is to speed up the Biosensor reaction at ANODE and CATHODE .In this paper I am presenting Mobilization and Immobilization of Glucose oxidase powder which enhances the reaction.

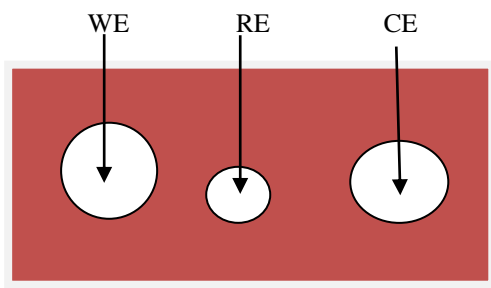
**Keywords:** Biosensor, Enzyme, Mobilization, Immobilization.

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## 1. INTRODUCTION

BIOSENSOR is found by MICHEAL CLARKE in 1962.It consists of working electrode, reference electrode and counter electrode. Working electrode is made of Glassy carbon, reference electrode is made of Ag, Agcl, counter electrode is made of platinum.

The schematic is given by



The above diagram shows the 3 electrode biosensor with working electrode, counter electrode and reference electrode. The 3 electrodes are dipped in bulk solution ,the bulk solution is phosphate buffer. Why phosphate buffer is taken, because of presence of phosphate in human DNA. This paper consists of mobilization and immobilization conditions of GODx enzyme

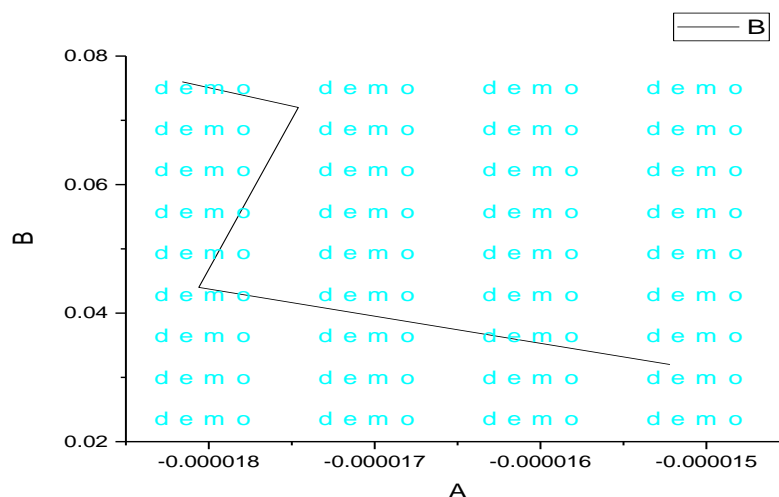
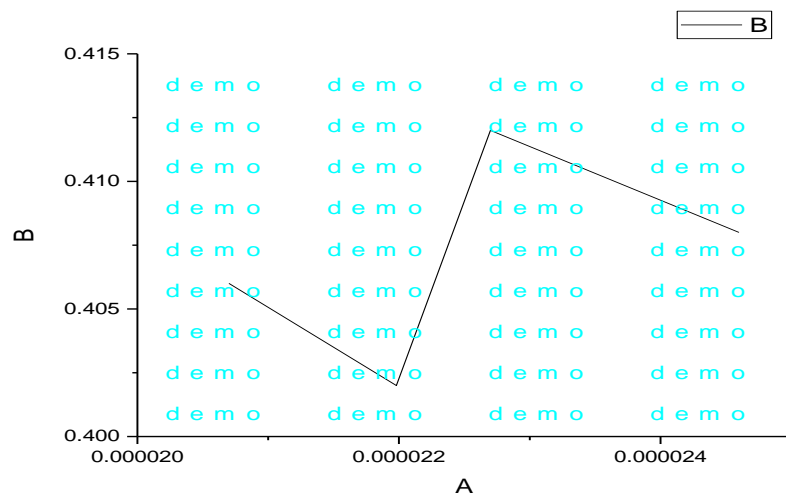
Which will be drop casted on biosensor surface. Experimental procedure is carried out in the following way .The biosensor glass with 4 openings is cleaned thoroughly and tested with ferro ferro solution.The ferroferri test is done PREPARING the device to be ready or for testing analyte. Analyte means analysis on whom is done.In this paper my analyte is cancerous blood sample.It is taken from a cancerous patient and thoroughly it is dropped in biosensor as BULK solution. Biosensor bulk solution is prepared in the following way.It can be prepared with phosphate buffer ,ferroferri solutions or any other mixture of 2 acids or chemicals or both,.In this paper I have taken H<sub>2</sub>SO<sub>4</sub> and TIO<sub>2</sub> NANO particles.ur manuscript in different sections.

## 2. EXPERIMENTAL SETUP

The biosensor with bulk solution along 3 electrodes is connected with a new software called ELECTRO COM Software. The electrocom software gives the oxidation and reduction cycles of the biosensor which is used to detect a pathogen at early stage. In this paper I have taken cancer blood sample as pathogen. The electro com software is more advanced in detection of pathogens in blood samples. The blood sample is taken from the area where cancer is attacked, blood is taken.. For example, breast cancer patients sample is taken from their breasts, cervix cancer patients blood is taken from cervix, lung cancer patients blood is taken from flum which gets released by coughing. In this way the blood is taken from patients and poured into the biosensor cell and tested with phosphate buffer solution and ferroferri solution. The enzyme used is tested in 2 modes ie MOBILIZED and IMMOBILIZED versions.

### H<sub>2</sub> So<sub>4</sub>+TiO<sub>2</sub> nano particle as BULK SOLUTION:

SCAN RATE	Oxidation	reduction
50MV	I=20.7UA P=406MV	I=-15.22UA P=32MV
100MV	I=21.98UA P=402MV	I=-18.06UA P=14MV
200MV	I=22.70UA P=412MV	I=-17.46UA P=72MV
300MV	I=24.6UA P=408MV	I=-18.16UA P=76MV

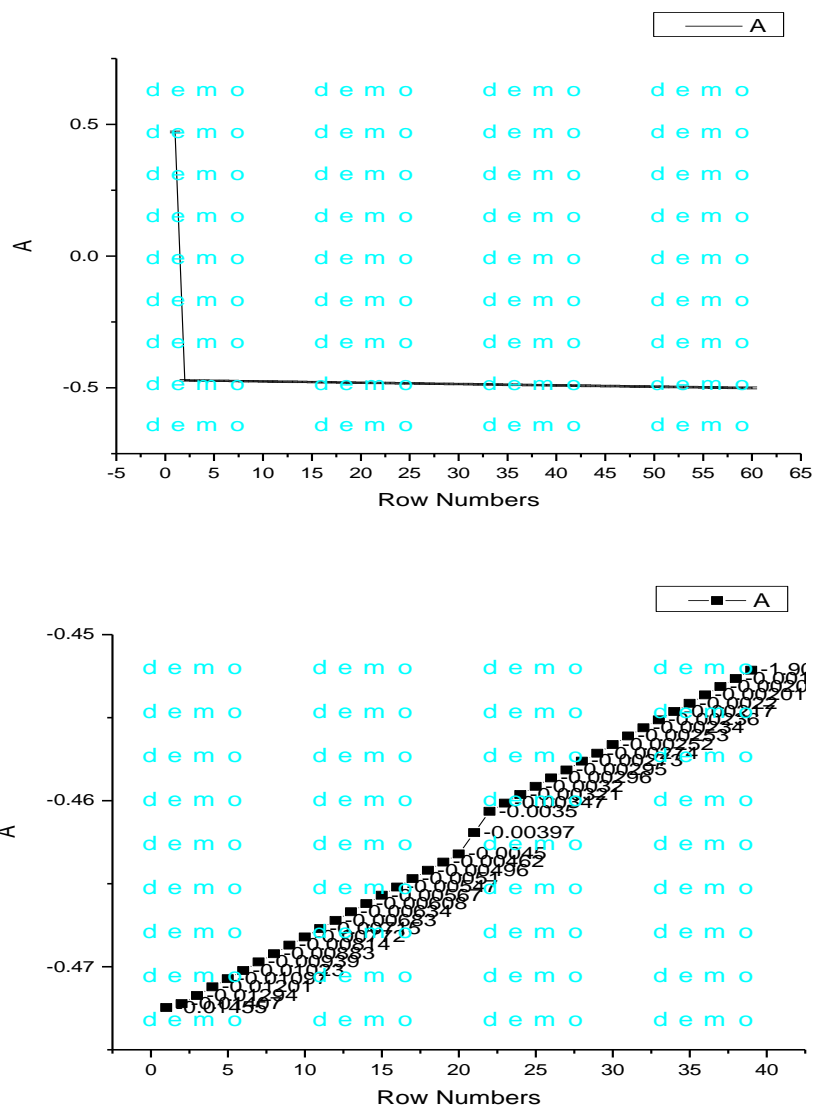


The above 2 graphs specify the Oxidation and reduction cycles of H<sub>2</sub>SO<sub>4</sub> and Tio<sub>2</sub> nano paprticles dumped in biosensor cell. The X axis represents voltage or potential in milli volts and Y axis represents Current in microamperes.

The current decreases, increases and again decreases in oxidation domain and in reduction domain, current increases and decrease and again it increases in reduction mode.

### 3. MOBILIZED AND IMMOBILIZED ENZYME

Enzyme are used as catylyts to speed up the reaction. In this paper the ENZYME used is glucose oxidase commonly called as GODX. When glucose oxidase is drop casted into the cell, the electron movement increases, the current increases for normal cells and there will be slight increase in cancerous cells. The below graphs illustrates the immobilized enzyme and mobilized enzyme on BIOSENSOR cell.



The above 2 graphs illustrates the immobilized enzyme and mobilized enzyme, in mobilized enzyme current increases and in immobilized enzyme, the current decreases. A specifies voltage or potential in millivolts and B specifies current in micro amperes.

### 4. CONCLUSION

In this paper I conclude that Biosensor working in MOBILIZED and immobilized Enzyme with H<sub>2</sub>SO<sub>4</sub>-Tio<sub>2</sub> Nano Particles.

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