

Micro BOD Measurement

INTRODUCTION

micro chip Biochemical Oxygen Demand (BOD)

BOD 가 BOD 가 5

BOD BOD

가 가

가

chip 가

가 가 가

THEORY

가 device

가

3 RE

(reference electrode), WE (working electrode), CE (counter electrode)

WE WE CE

WE



WE RE 가 가
 . RE
 가 가
 BOD

EXPERIMENTAL

30 °C 48 120 RPM
 15 3000 RPM 0.1 M PBS (Phosphate buffer solution)
 4 °C . 2 % Agarose gel T. Cutaneum
 . Device . (a)
 metallization, photolithography, electroplating .
 (b) KCl-hydrogel screen . (c) 가
 silicone spin coating . (d) .
 (e) microfluidic .
 Ag/AgCl RE (reference electrode) -1 V 1 V
 0.1 PBS (Phosphate buffer solution) .
 BOD
 가
 가 . BOD
 BOD (chemical BOD₅= 50, 100, 200 ppm). Florida,
 Orlando Eastern Wastewater Reclamation Facilities (EWRf)
 BOD₅ .

RESULTS

Fig. 1

BOD

Fig. 2

300 mV

가 BOD

Fig. 3

가

Fig. 4

BOD

3 ppm

193 ppm

chemical BOD₅

2 ppm

182 ppm

Fig. 5

BOD

200 ppm

BOD

20

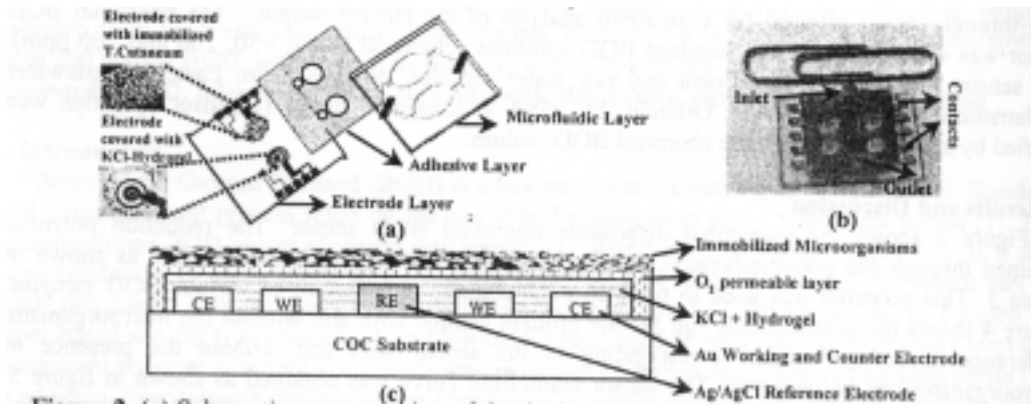


Fig. 1. (a) Schematic representation of the device. (b) Assembled view of the BOD sensor. (c) Cross section of the electrode with the immobilized microorganisms.

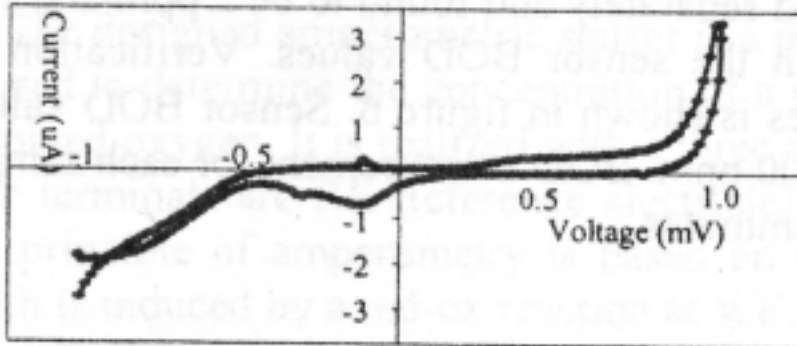


Fig. 2. Cyclic polarization to determine the operating potential of the sensor.

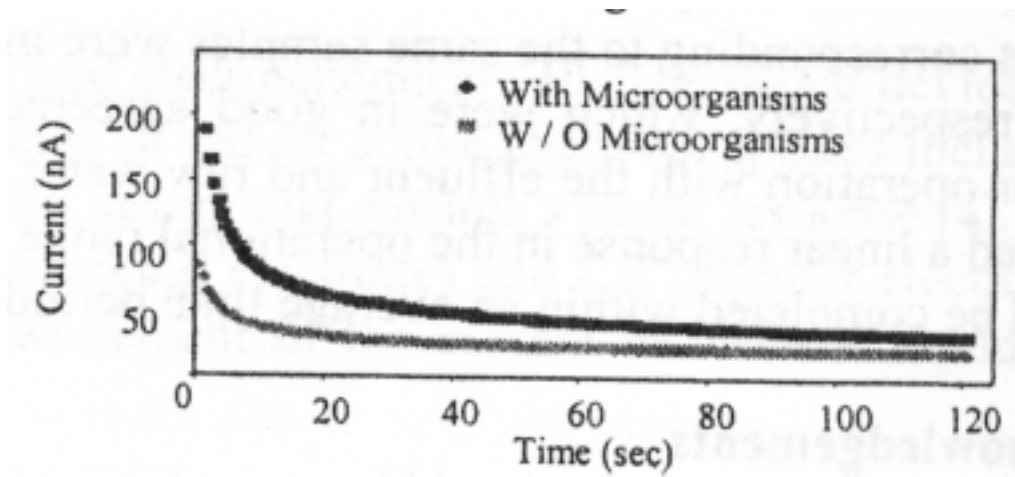


Fig. 3. A typical output signal of the sensor for a sample solution.

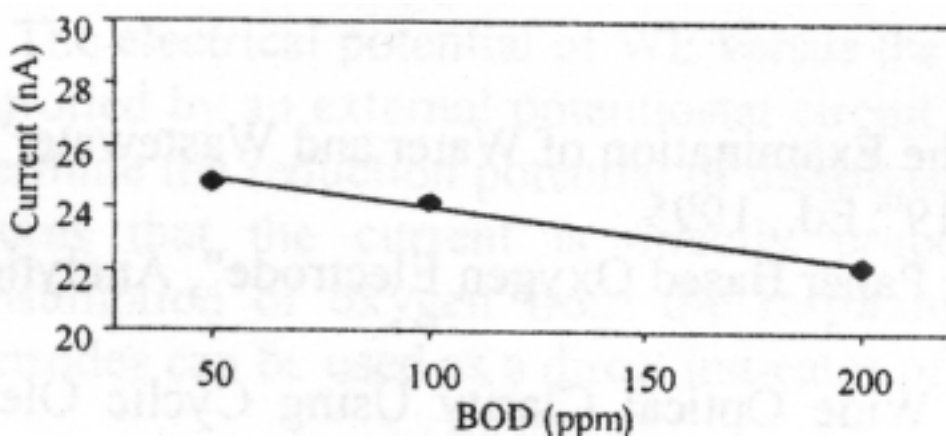


Fig. 4. BOD calibration curve with standard BOD solution of 50, 100 and 200 ppm.

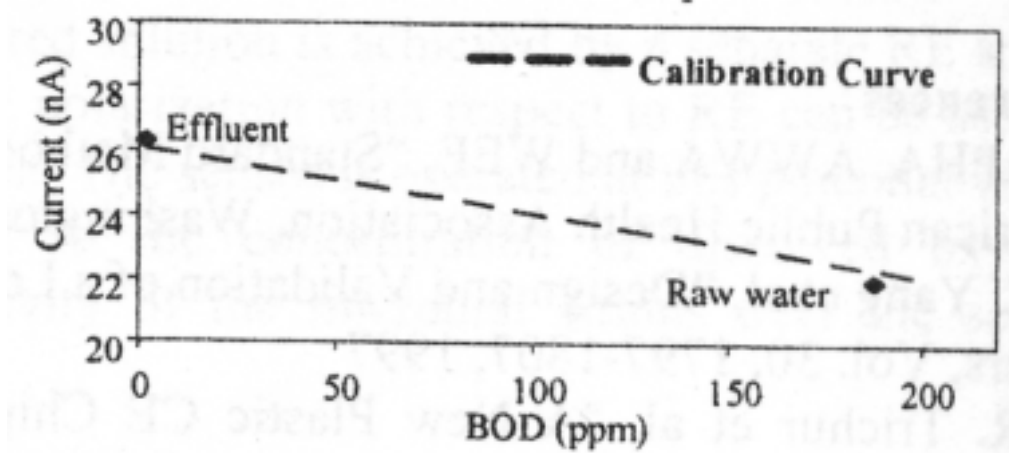


Fig. 5. Measured BOD values for the effluent and Raw water samples.

CONCLUSION

BOD (biochemical oxygen demand) 5

BOD

COC(Cyclic Olefin Copolymer)

BOD . 200 ppm BOD