



INTRODUCTION

Detection of antibiotic in the environment is a key to preventing antibiotic resistance. Electrochemistry is a highly sensitive and reliable tool for detection of antibiotic. Auranofin is a highly useful antimicrobial compound yet to be characterized in aqueous media.

OBJECTIVE

Understanding the electrochemical behavior of Auranofin (Af) in aqueous media and defining parameters for its detection.

Method

Af can be detected in aqAf was first diluted in Dimethyl Sulfoxide(DMSO) and then 0.1 M KCl. Carbon Black (CB) was pipetted onto WE. The WE applies a potential reducing/oxidizing Af. The current from the redox reaction is then measured. Cyclic voltammetry (CV) was main method of analysis. CV applies a linearly changing potential over time. A cathodic scan was used which reduced and then oxidized Af..

Results and Discussion

- Aqueous media using a carbon coated WE
- A coating of 840 $\mu\text{g}/\text{cm}$ gave the most enhanced current signal
- Peak reduction peaks, at 0.27 V and 0.10 V and oxidation peaks were observed at 0.81 V and 1.0 V (vs. Ag/AgCl).
- Af was detected in concentration as low as 150 and 200 nM
- Au(I) was reduced to Au (0) and trapped in the CB as

References

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2. A. A. Mohamed, A. E. Bruce, M. R. M. Bruce. Cyclic voltammetry of auranofin.1999.
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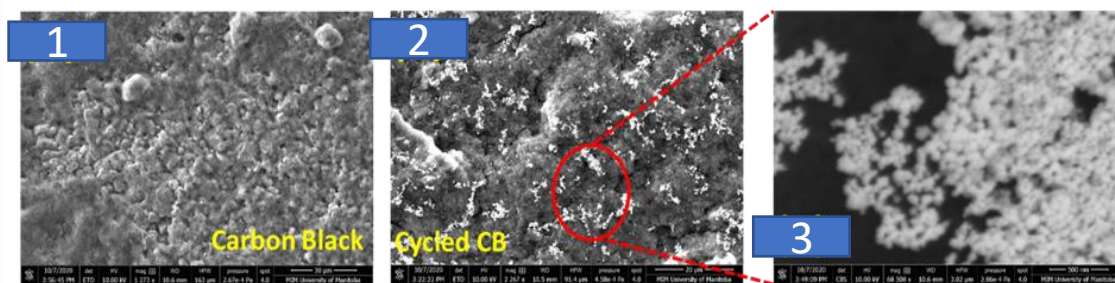
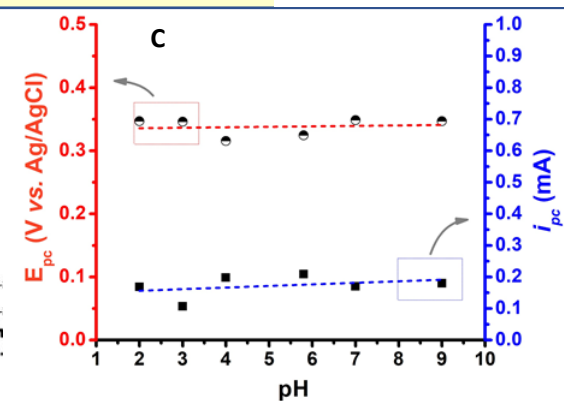
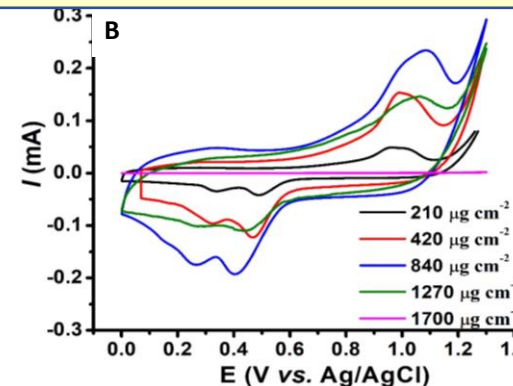
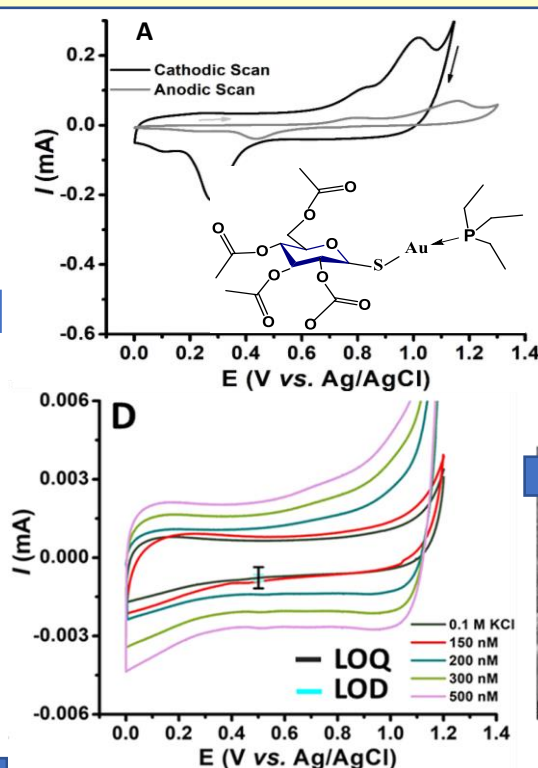


Figure A) CV of 1mM Af in 0.1 M KCl showing the effect of scan direction on peak current. Af structure inset (B) Effect of differing amounts of carbon coating in detection of 1mM Af in 0.1 M KCl (C) Cathodic peak current and potential of Af in varying pH levels (D) Limit of detection (LOD) and limit of quantification (LOQ) of Auranofin in KCl are 150 and 200 nM, respectively. (E) Scanning electron microscopic (SEM) images collected before and after electrochemical measurements. (1) SEM image of carbon black coated on screen-printed electrode (before electrochemical measurements), (2) after 100 cyclic of CVs experiment, and (3) zoomed version of B shows the formation of Au-NPs.

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