

Electrochemical techniques for monitoring analytes dissolved in acidic solutions for the food industry



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INTRODUCTION

Goal: Present the preliminary results of a different approach for sensing dissolved analytes using electrochemical techniques.

Main Application: Monitoring sulfites in the food industry in Real-Time.

MATERIALS & METHODS

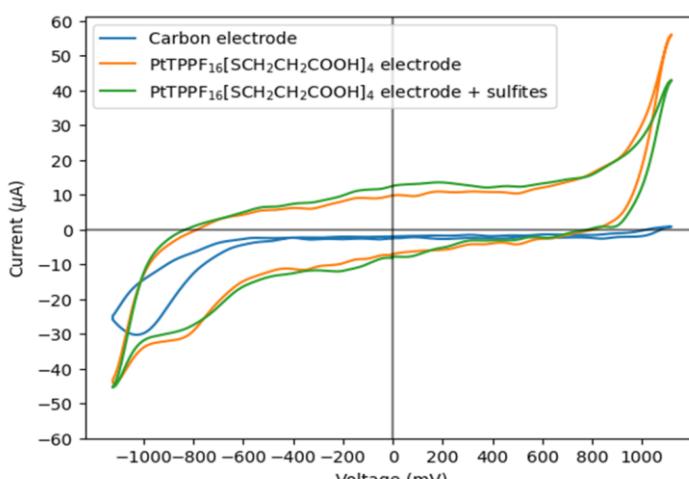
Electrodes

- Carbon
- Gold
- Metalloporphyrins

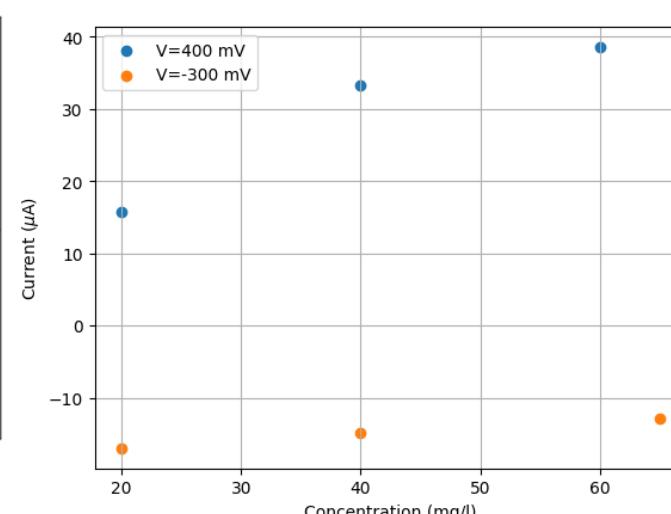


RESULTS

Porphyrin's response to sulfites

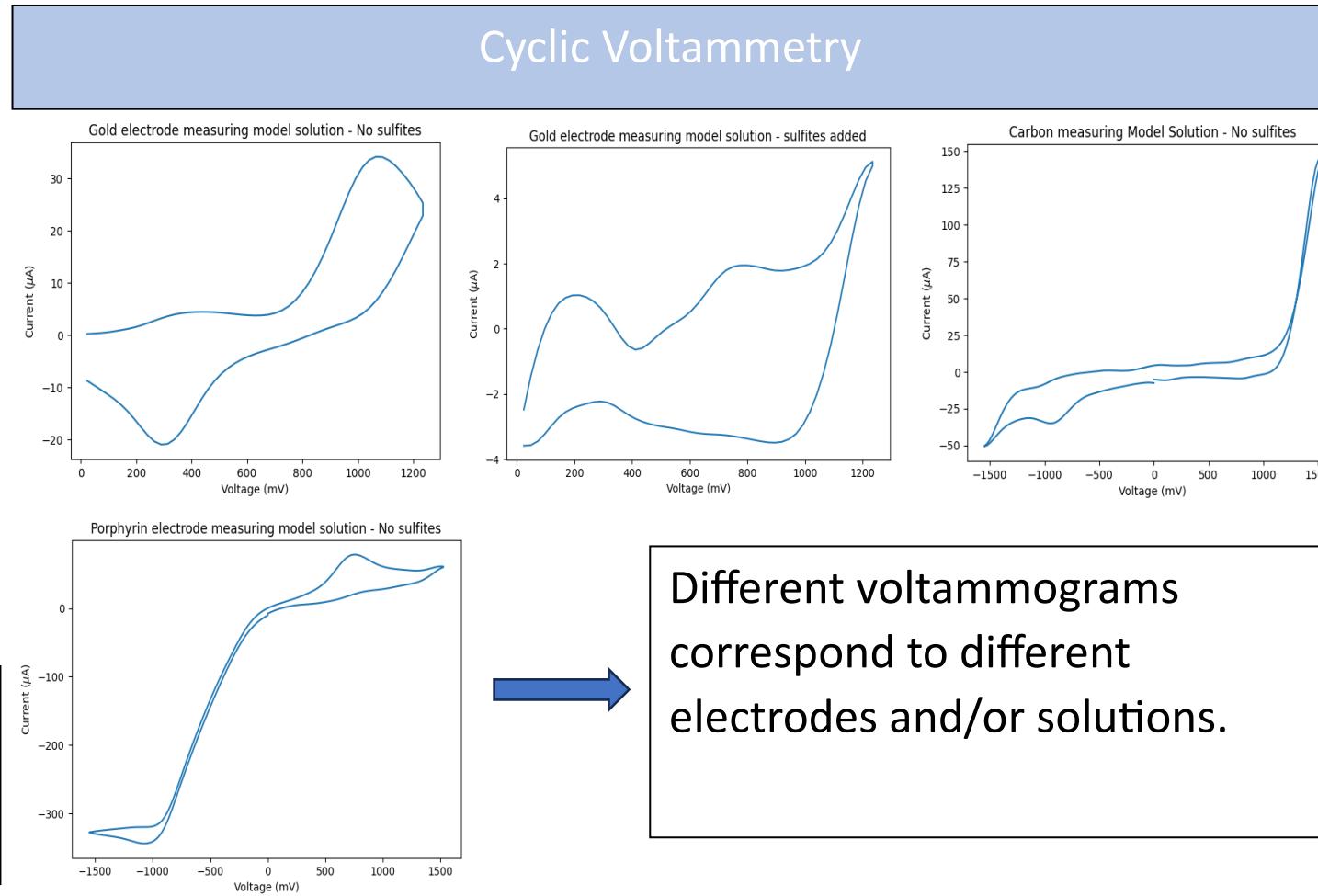
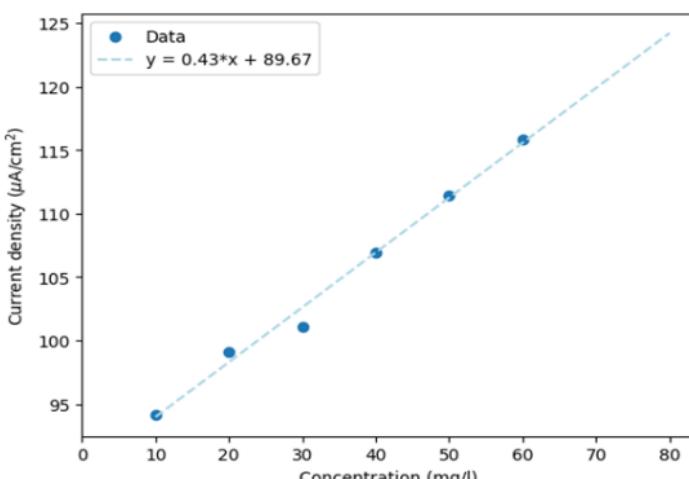


DC Amperometry and Pulsed Amperometric Detection



Amperometry	ΔI_{max}	Signal Decay
DC	10,220 μA	Yes
PAD	2,641 μA	No

PAD stabilized the signal detected.



The electrodes activated with $\text{PtTPPF}_{16}[\text{CH}_2\text{CH}_2\text{COOH}]_4$ are sensitive to sulfites.

Different voltammograms correspond to different electrodes and/or solutions.

CONCLUSIONS

- Porphyrins respond to different concentration of sulfites at low pH;
- PAD can be used to quantify sulfites, displaying a stable signal;
- CV identifies different electrodes and analytes, providing important information;
- These tools can be combined to monitor sulfites and other analytes in real-time.