

Fabricación de un biosensor electroquímico para detección de toxina

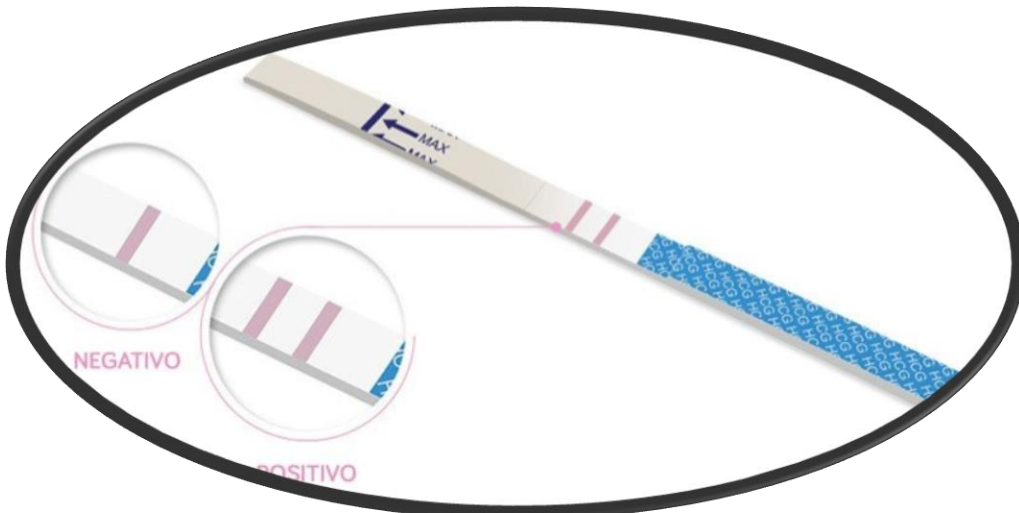
*Pablo A. Serrano*¹,

peibol1011@gmail.com

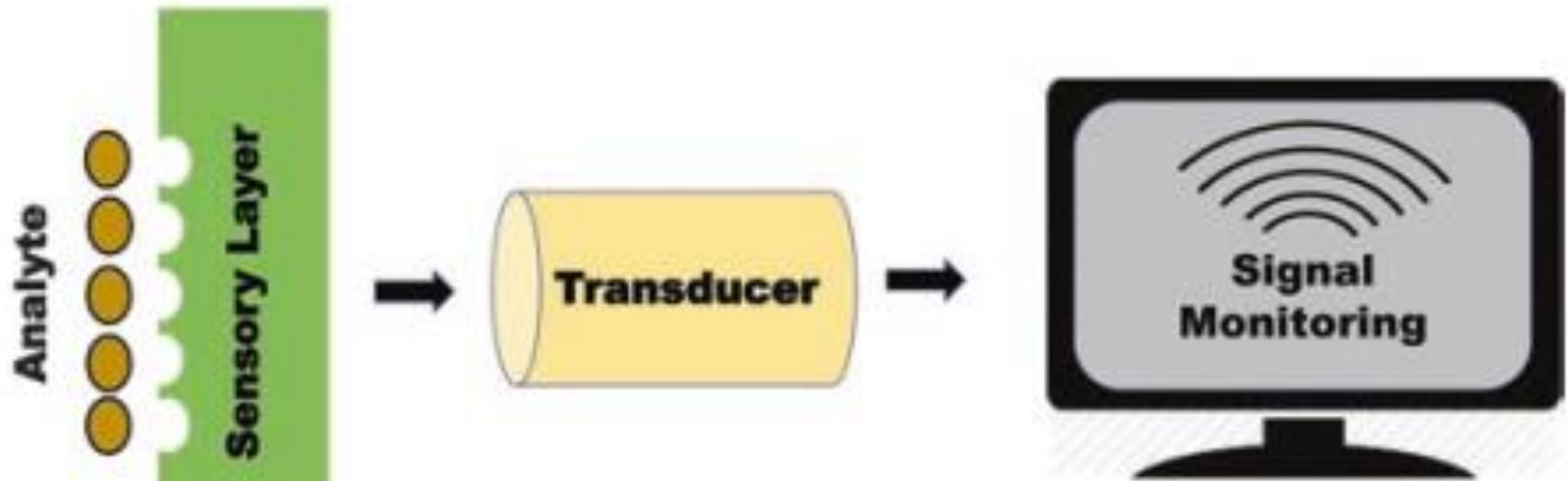
¹ Laboratório de Optoeletrônica Orgânica e Sistemas Anisotrópicos (LOOSA)

<http://loosa.paginas.ufsc.br/>

Biosensores comerciales



Biosensor



Vantagens de um biossensor

Barato

Rápido

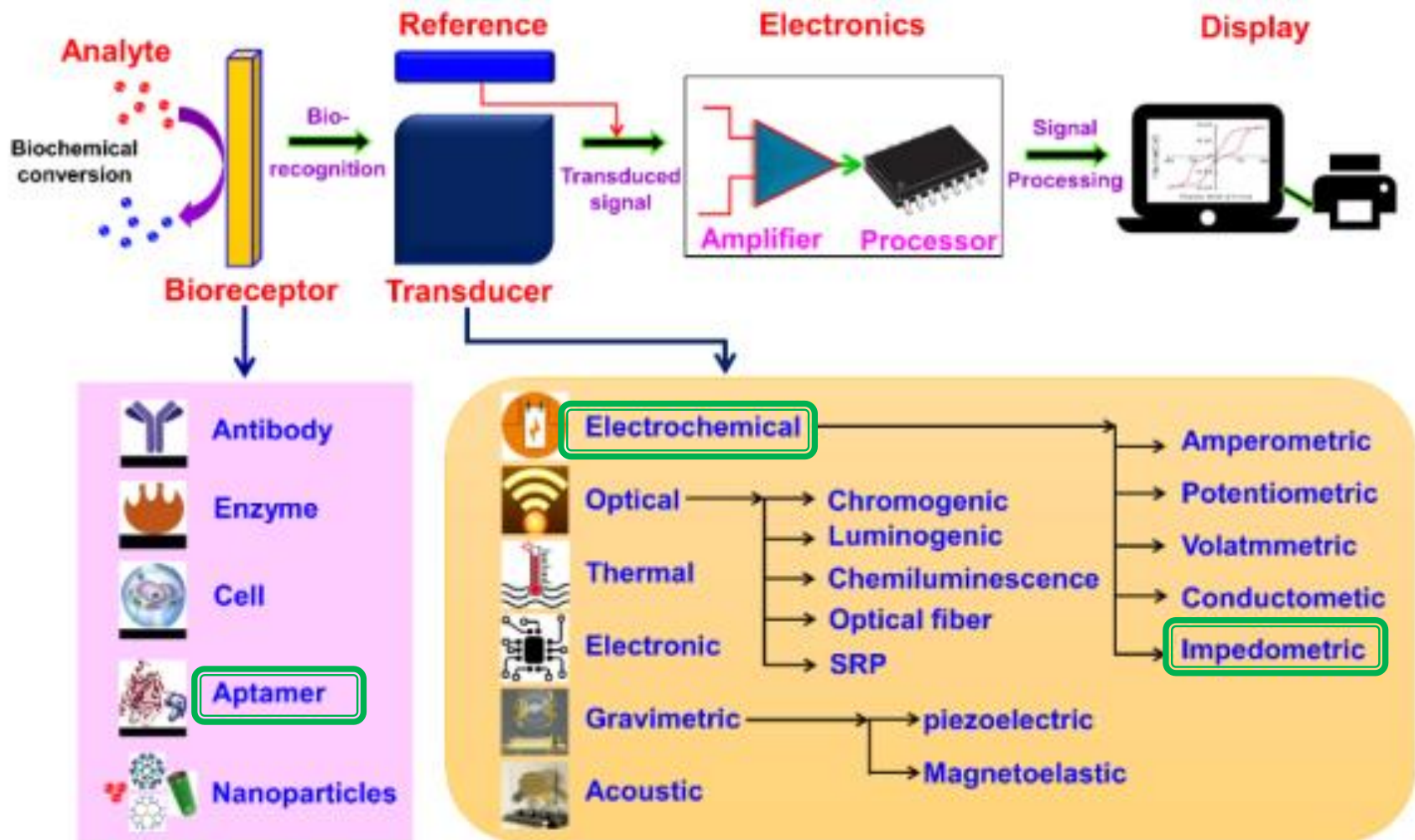
Biossensor

Simple

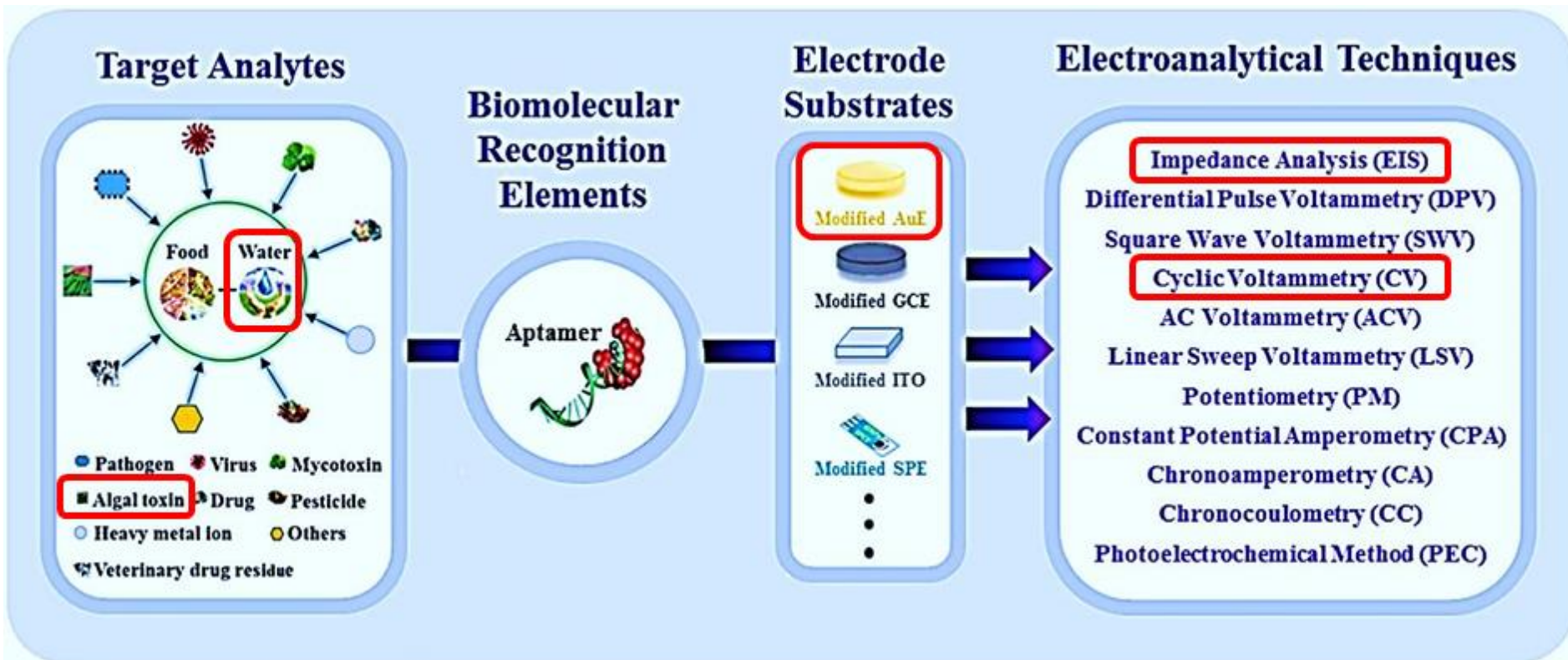
Sensível

Específico

Biosensor



Aptasensores



Problemática



Problemática

+100 mil
habitantes

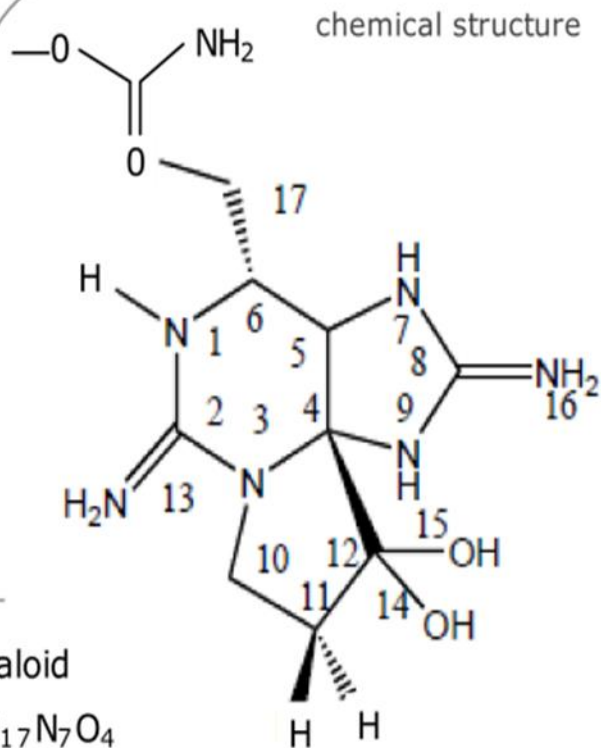
Neurotoxina que consumida em altas concentrações causa
paralisa e pode levar a morte animais e pessoas

Lagoa do Peri

Saxitoxina (STX)

Biossensor

Materiais e Métodos: Saxitoxina (STX)



natural sources: Dinoflagellates

Pyrodinium bahamense
Alexandrium spp.
Gymnodinium catenatum
Cyanobacteria
Anabaena sp.
Aphanizomenon spp.
Cylindrospermopsis sp.
Lyngbya sp.
Planktothrix sp.

health impact: paralytic shellfish poisoning

molecular target: voltage-gated ion channels

pharmacology: pore blocker

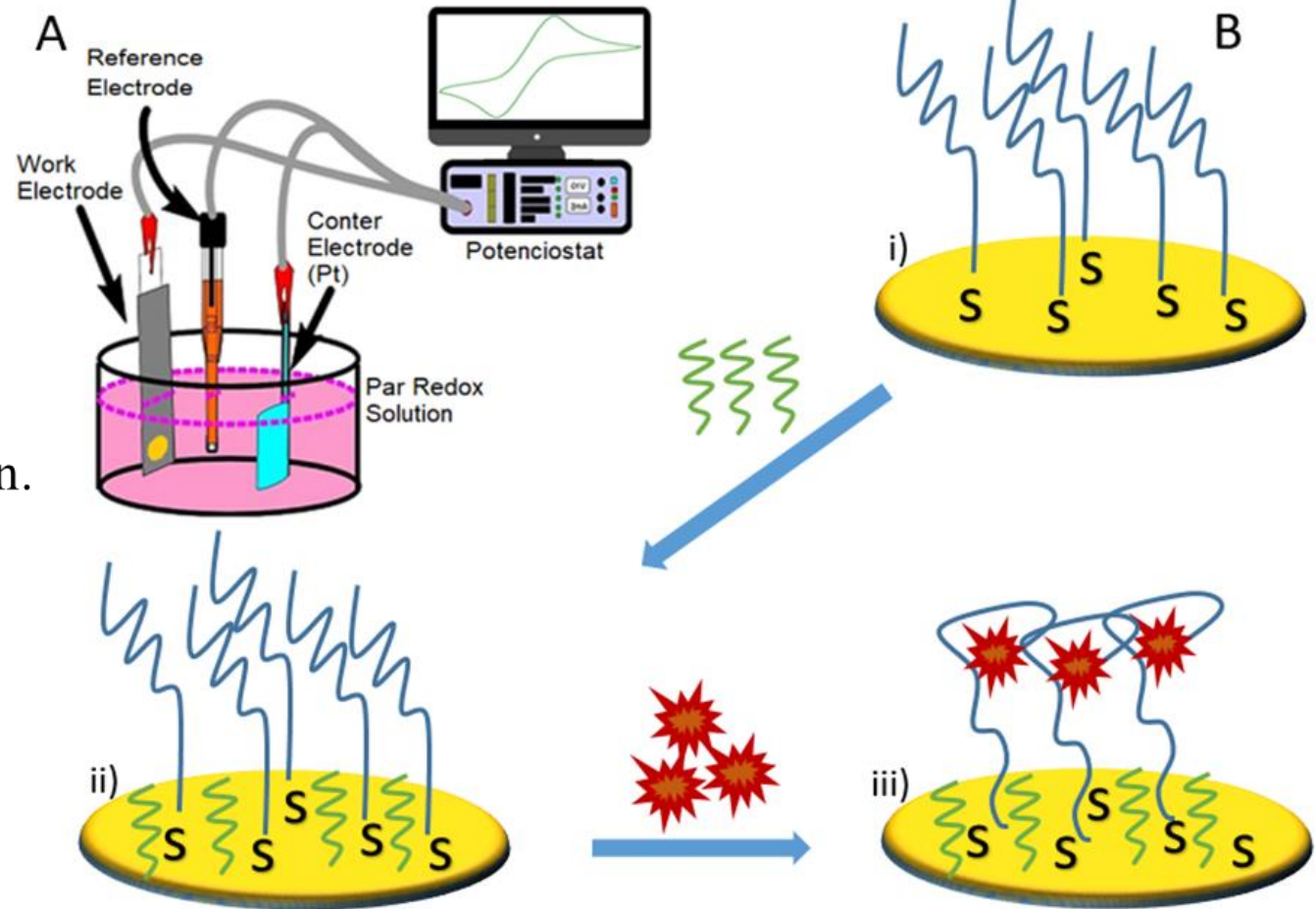
Materiais e Métodos

5'-T TGA GGG TCG CAT CCC GTG GAA ACA GGT TCA TTG AAA AAA AAA

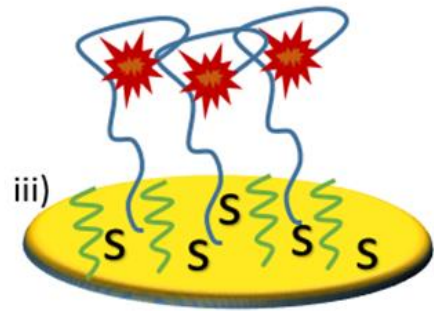
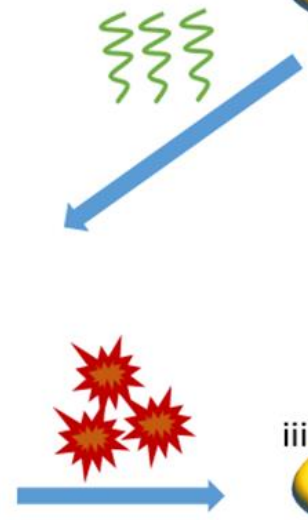
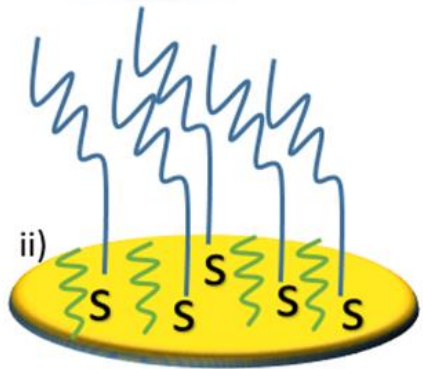
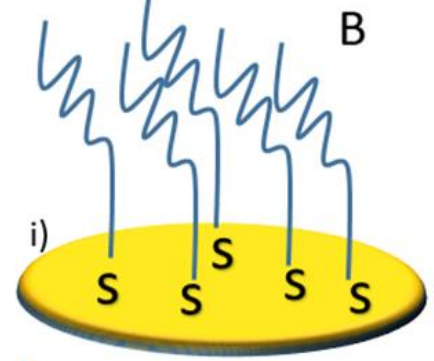
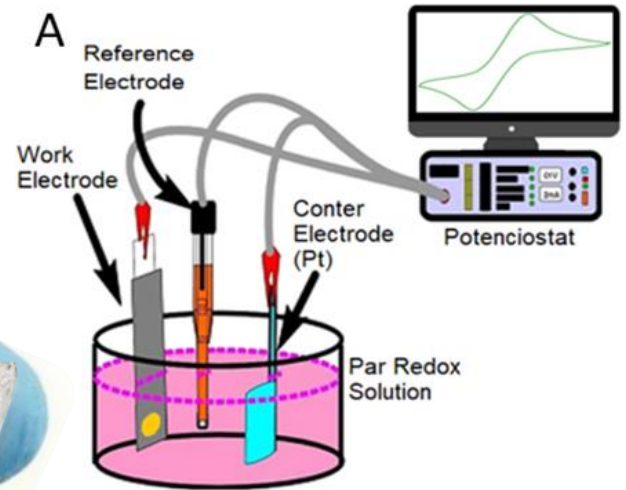
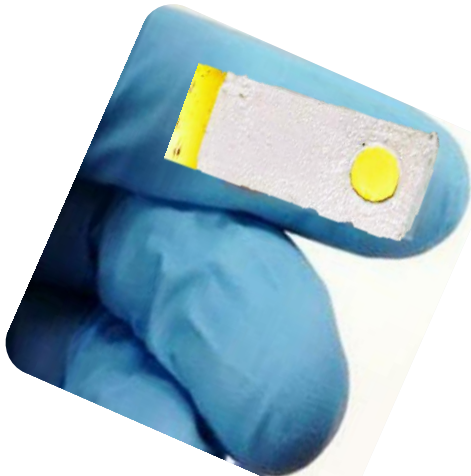
AA-C₆S-S-3' = M-30f

Cleaning method:

- Alumina slurry.
- H₂O₂+KOH solution.
- Electrochemically sweep in KOH 50mM.

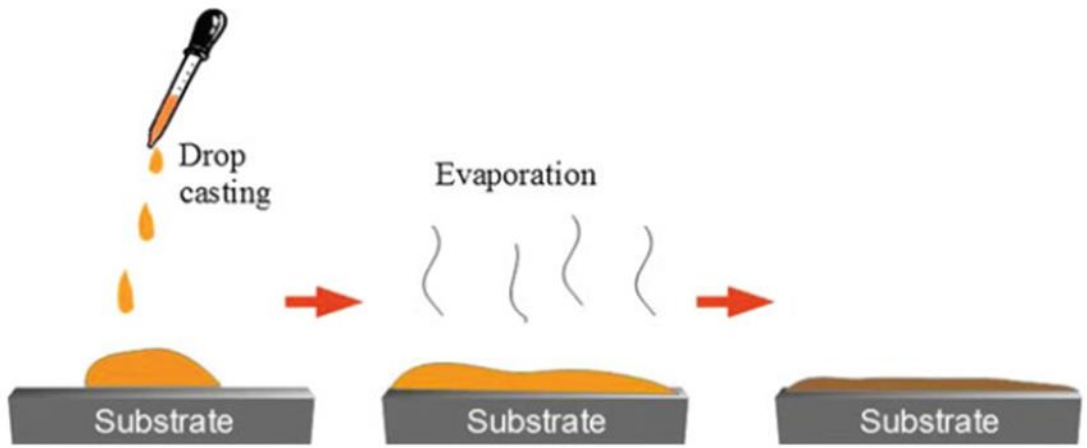


Materiais e Métodos

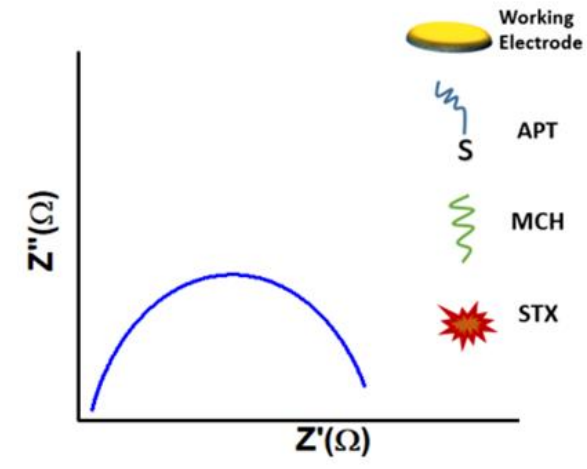
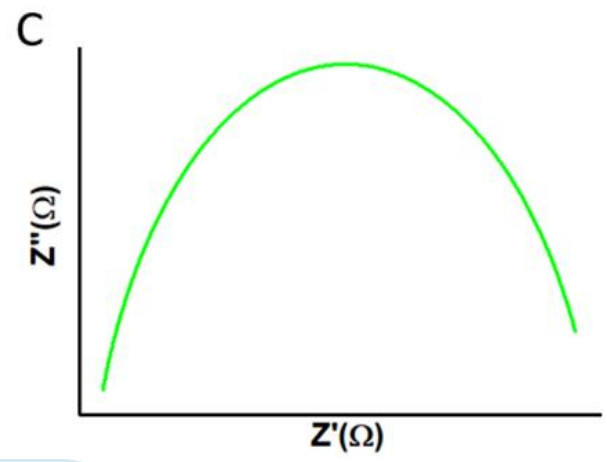
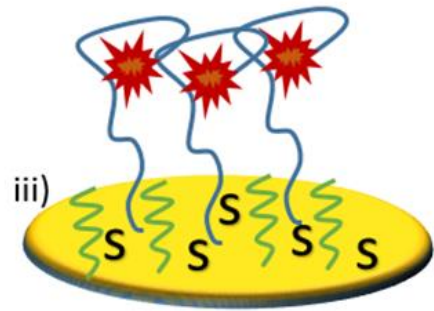
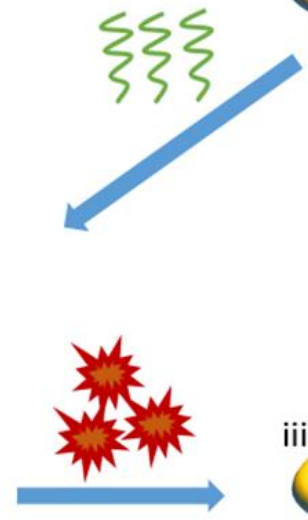
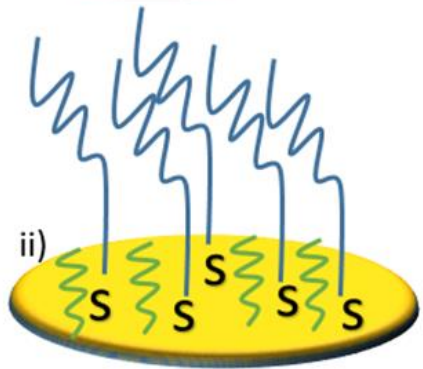
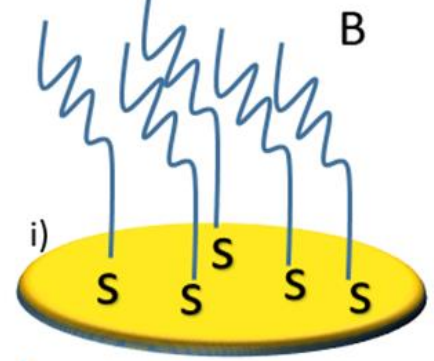
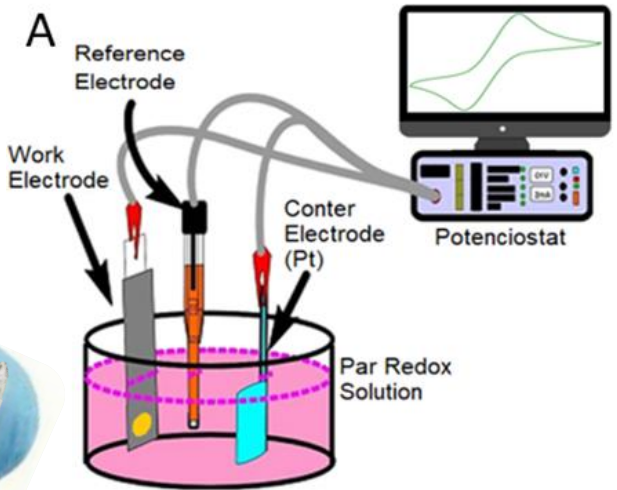
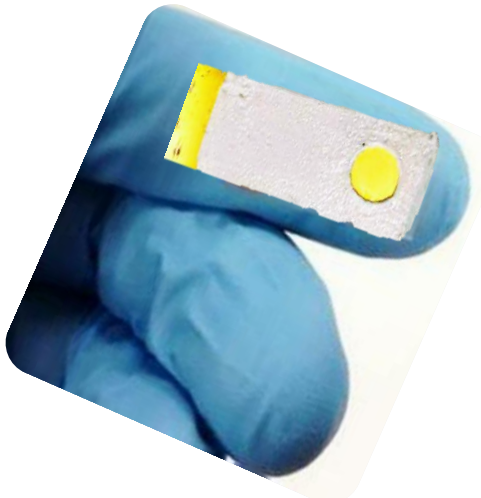


Cleaning method:

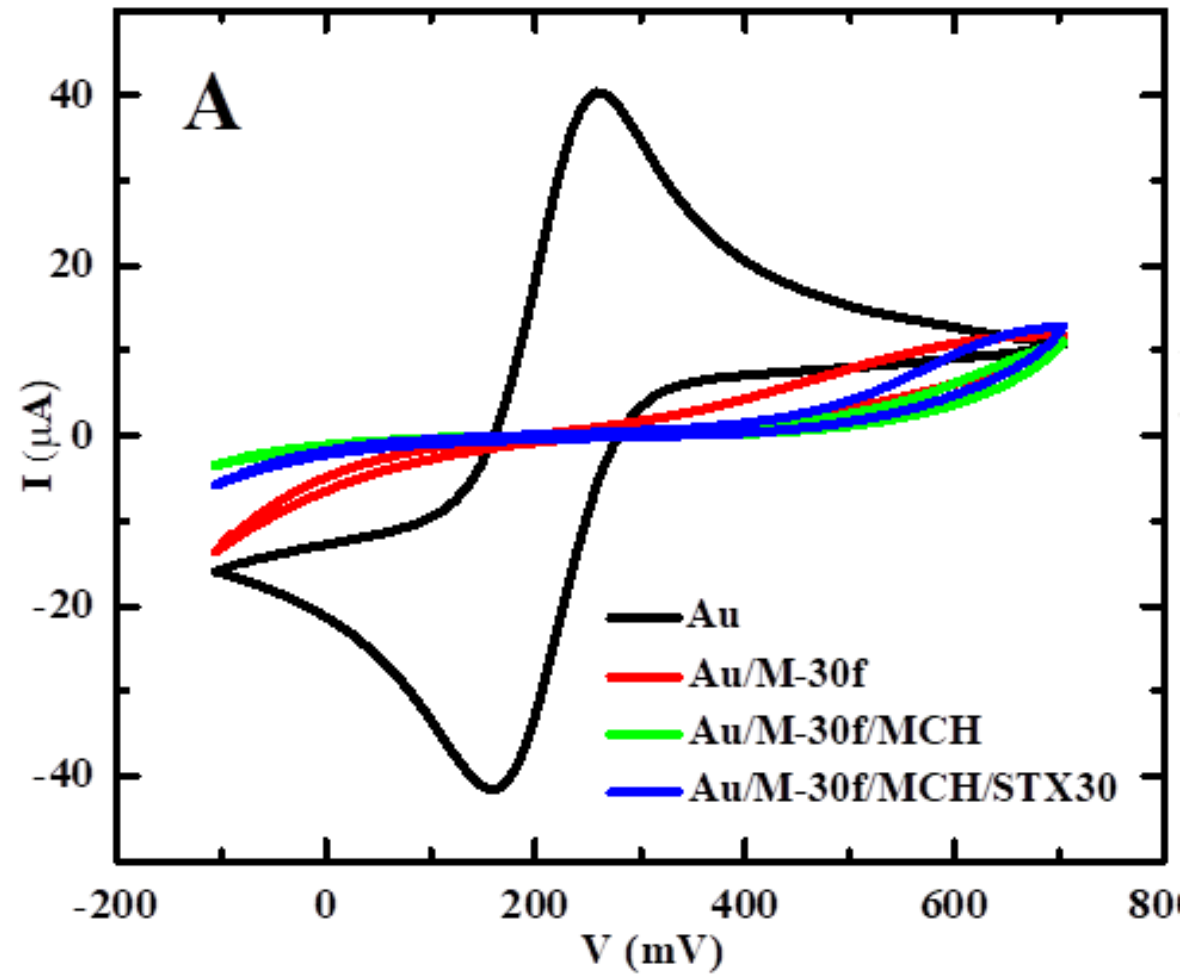
- Alumina slurry.
- $H_2O_2 + KOH$ solution.
- Electrochemically sweep in KOH 50mM.



Materiais e Métodos



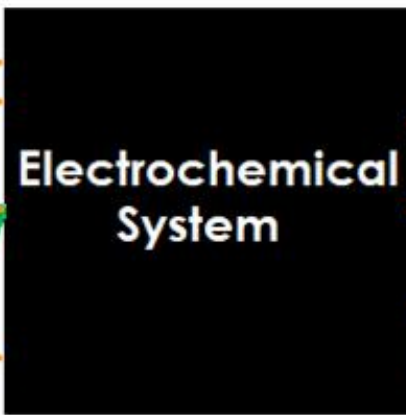
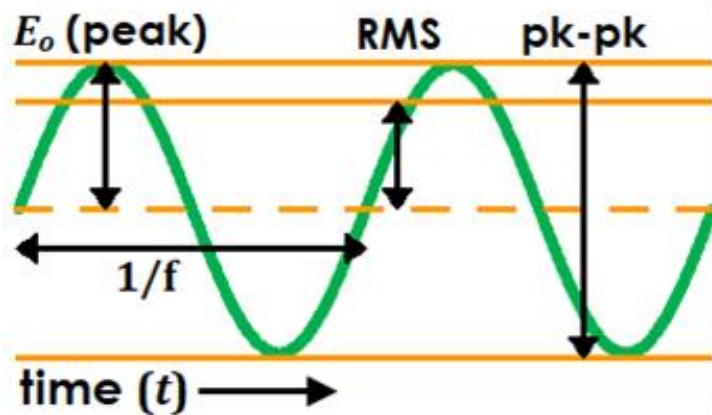
Resultados



Espectroscopia de Impedância Eletroquímica (EIE)

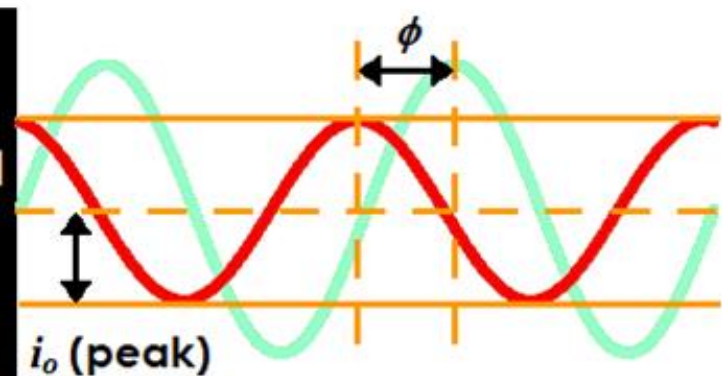
Input Signal:

$$E(t) = E_o \cos(\omega t)$$

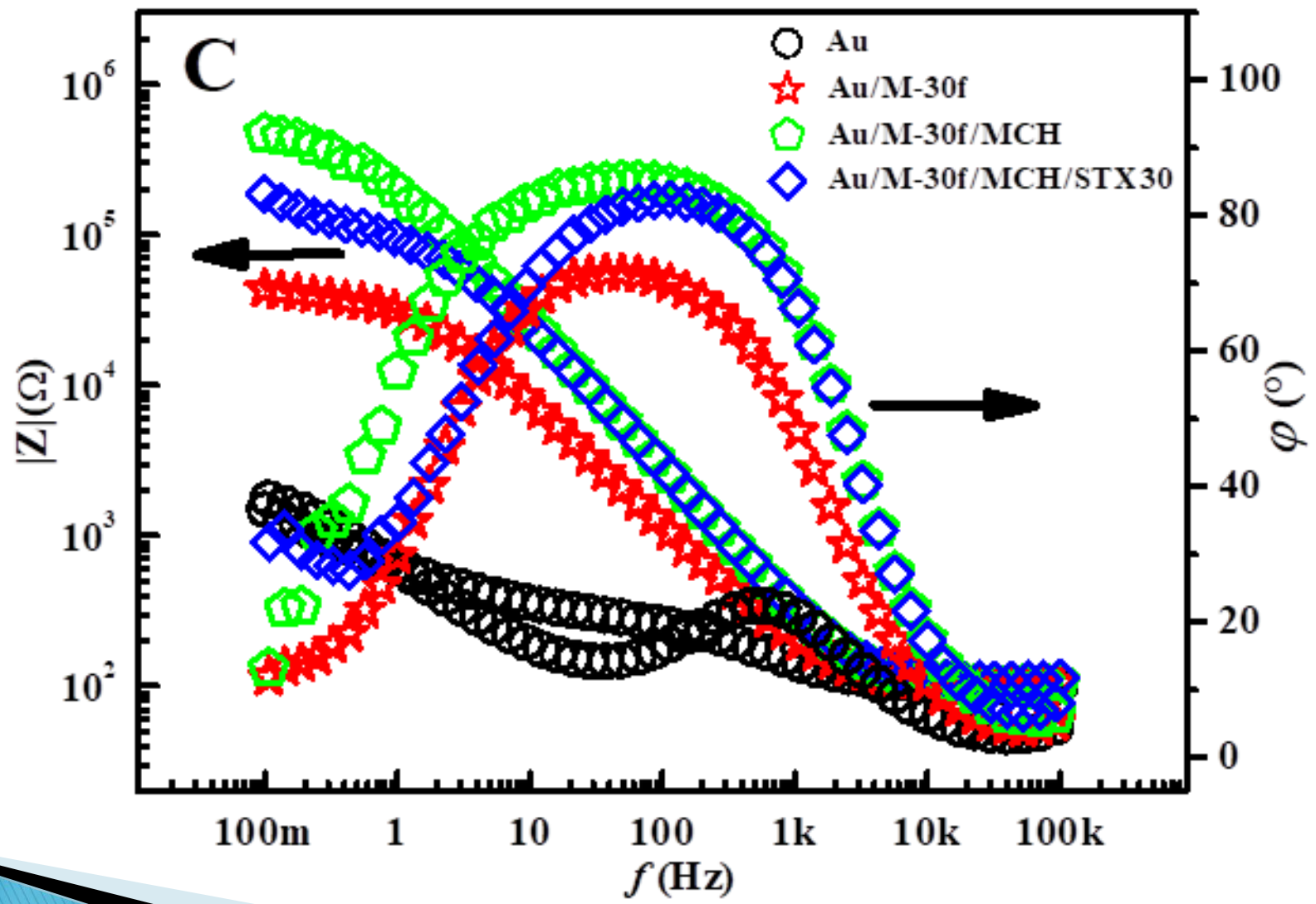


Output Signal:

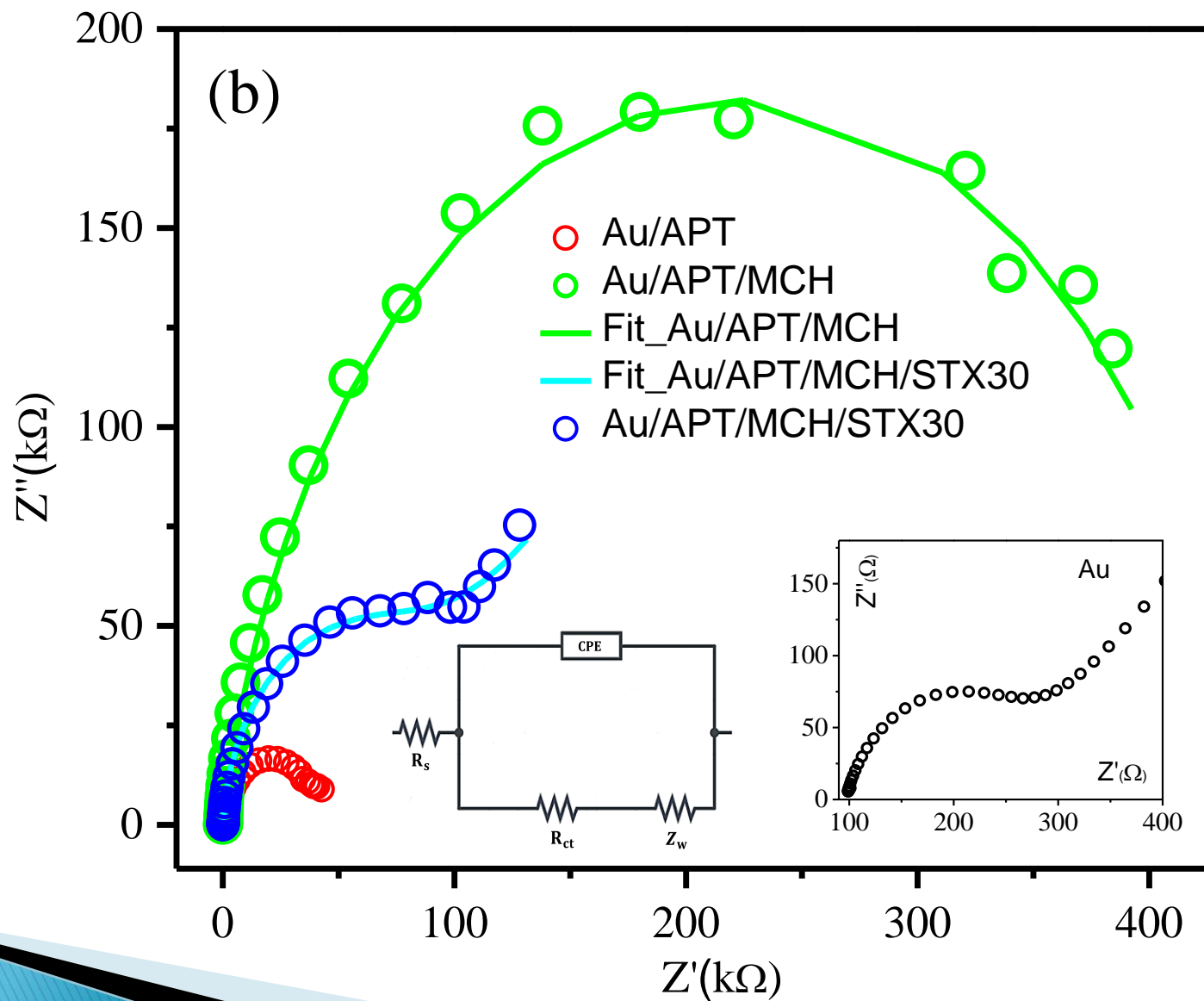
$$i(t) = i_o \cos(\omega t - \phi)$$



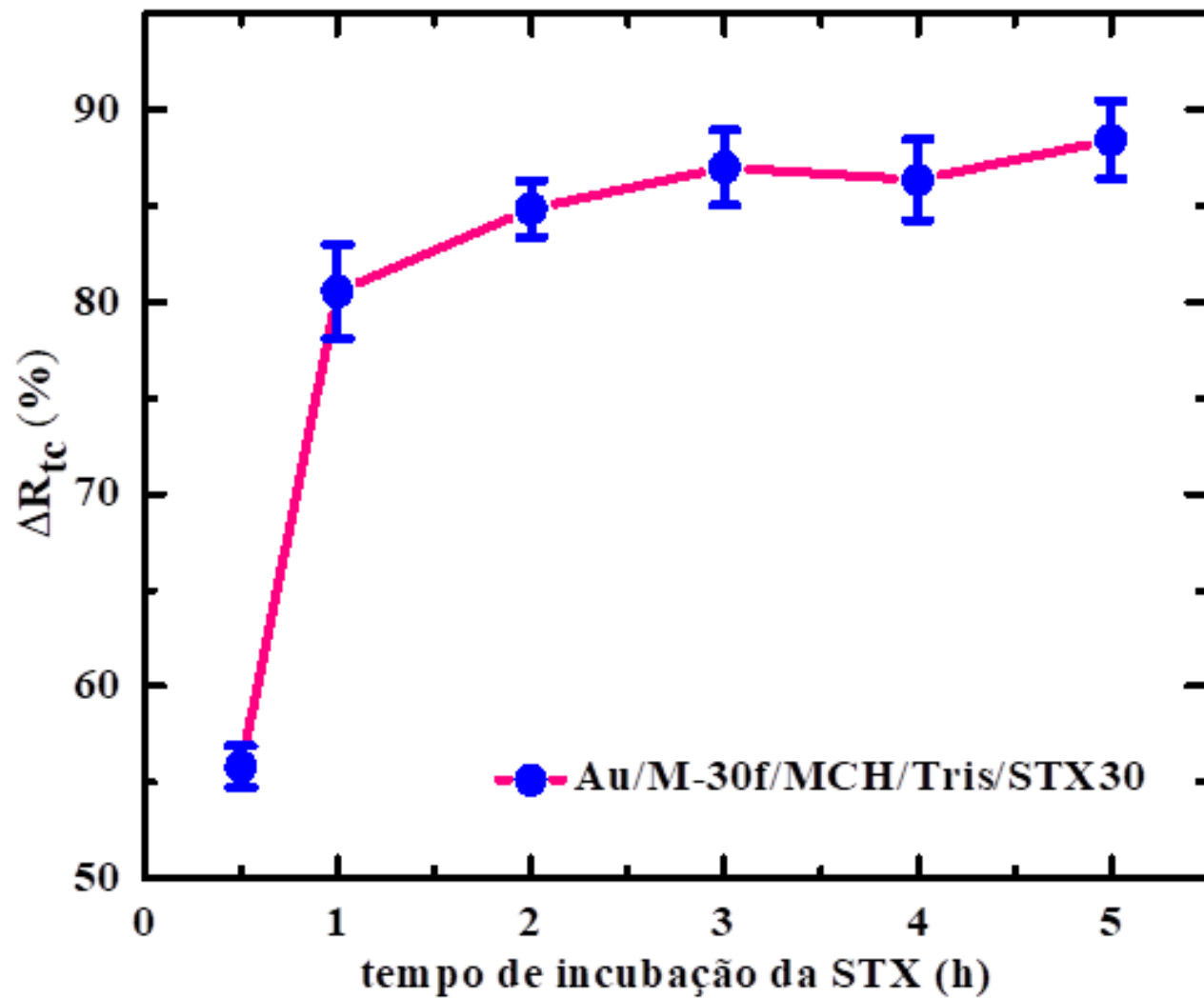
Resultados



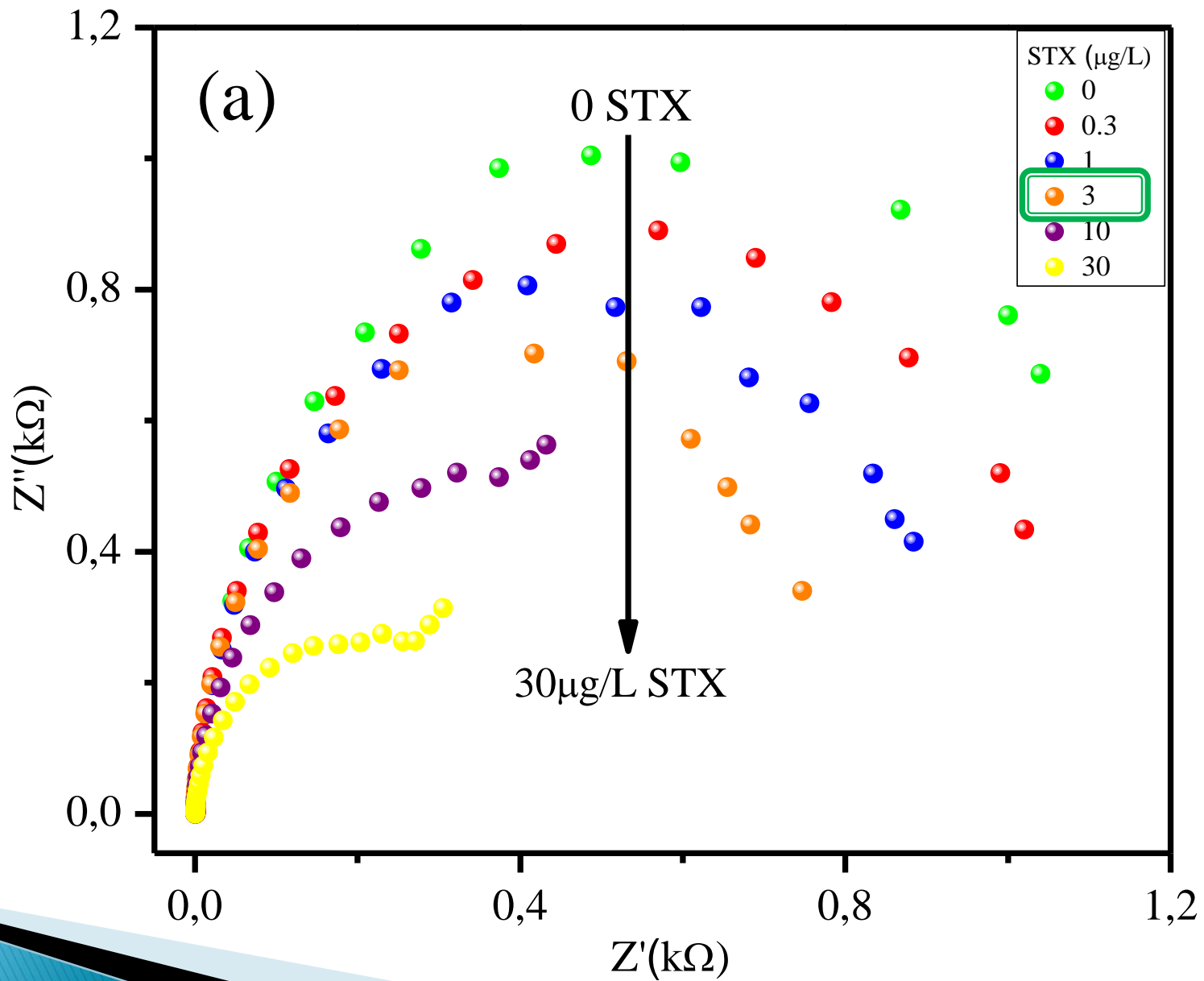
Resultados



Resultados

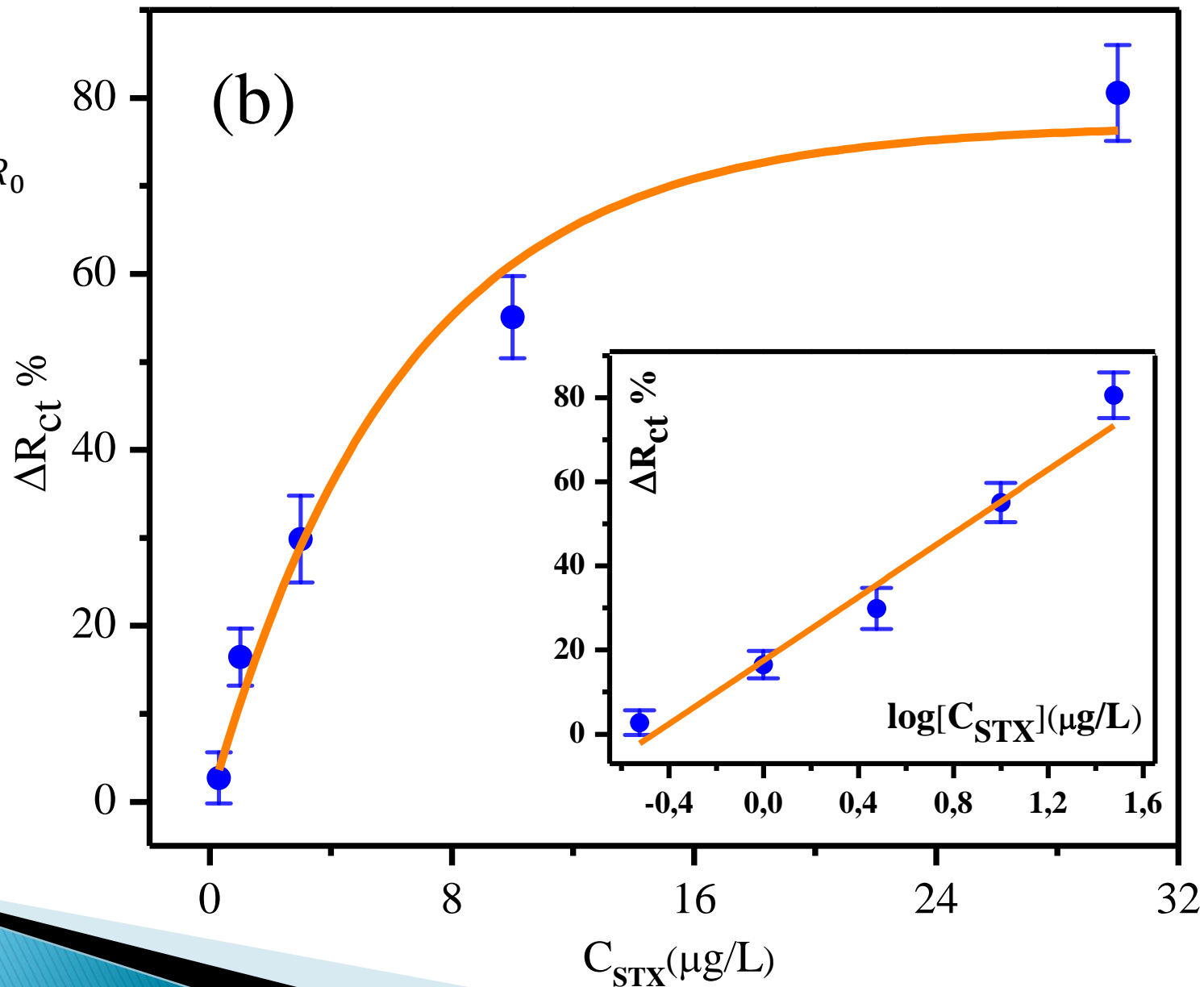


Resultados

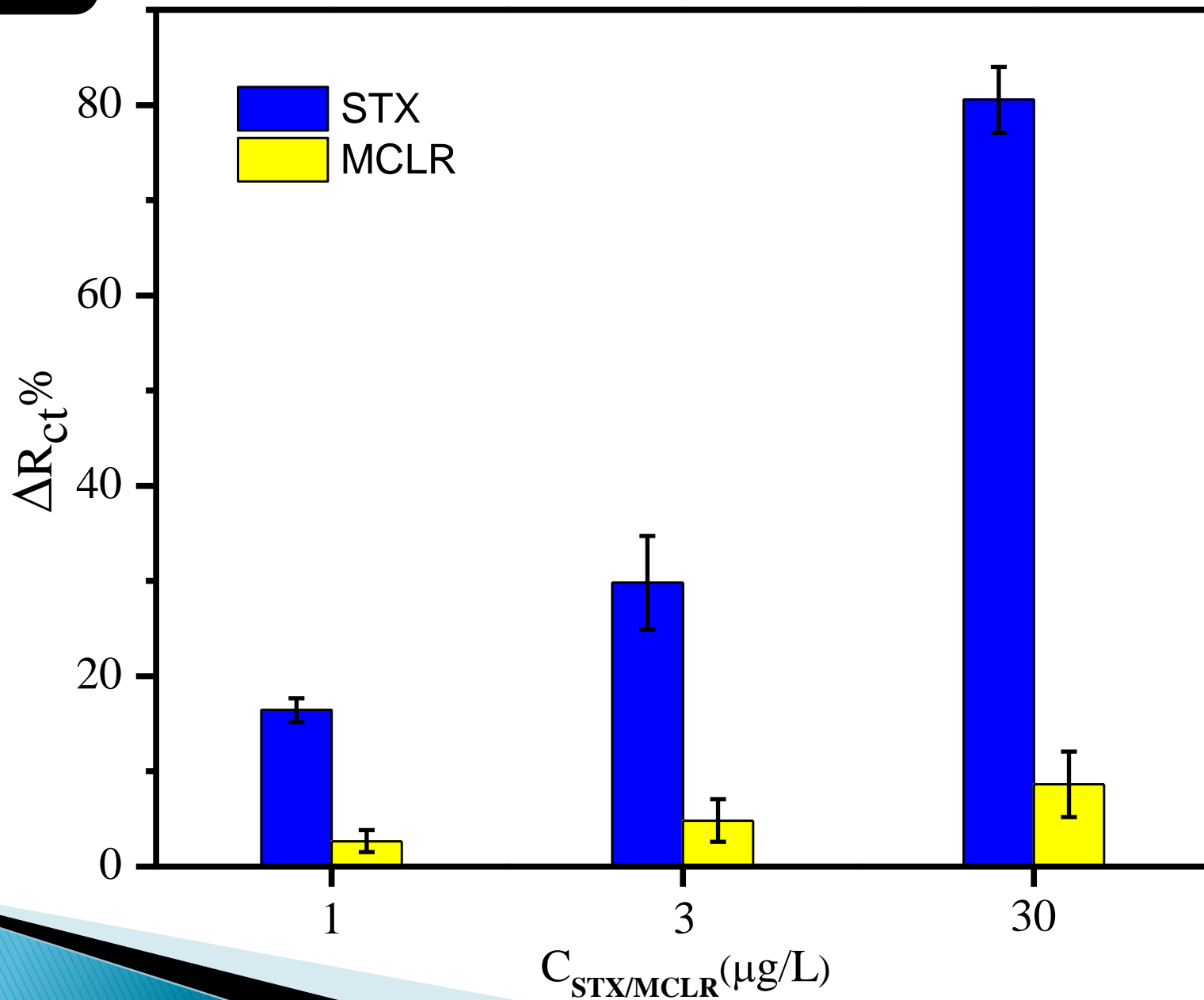


Resultados

$$\Delta R_{ct} = 1 - R/R_0$$



Resultados






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Agradecimentos

