

Kabelo S. Banda¹, and Omolola E. Fayemi¹

¹Department of Chemistry North-West University

E-mail: kabelobanda11@gmail.com

INTRODUCTION

Pollution of water with toxic metals is a global health crisis. One of the most common metals found in water is iron (Fe) [1]. Iron in water is usually detected using methods such as spectroscopy and chromatography. However, these techniques often take a long time and require complicated steps before testing [2]. Because of these challenges, there is a growing need for simpler and faster sensors that can quickly and reliably detect iron in water. This study contributes to SDG 6 and sheds light on green chemistry

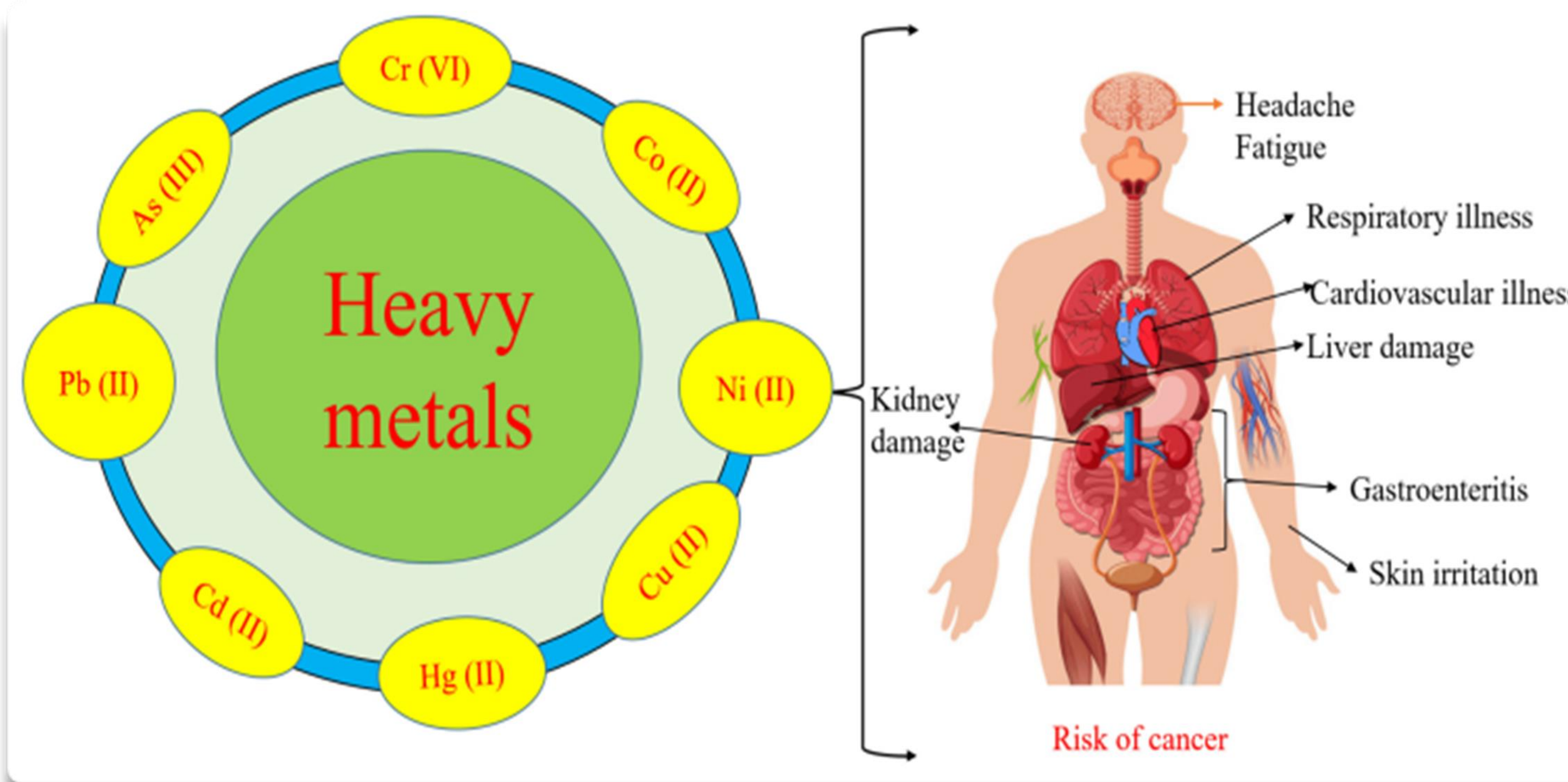
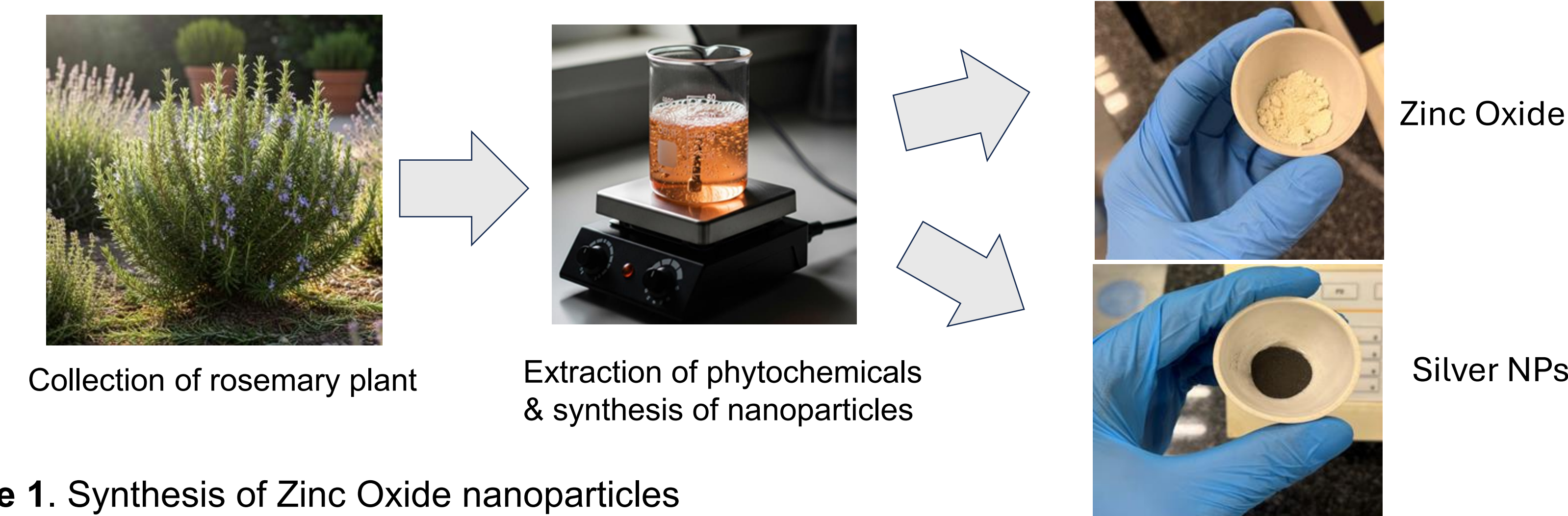


Fig 1: Various illnesses caused by toxic metals in water. [2]

METHODOLOGY



Scheme 1. Synthesis of Zinc Oxide nanoparticles and Silver nanoparticles using rosemary plant

RESULTS

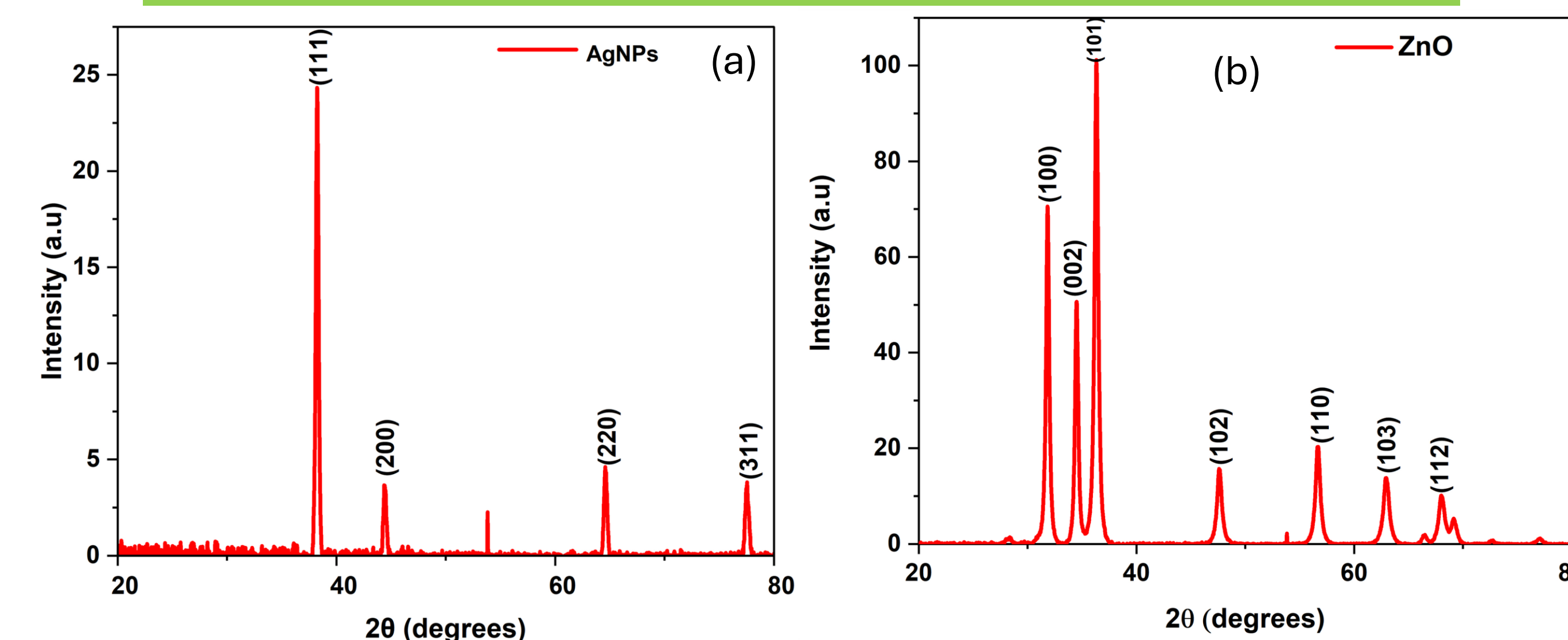


Fig 2. XRD Spectra of, (a) Silver nanoparticles . (b) Zinc Oxide nanoparticles

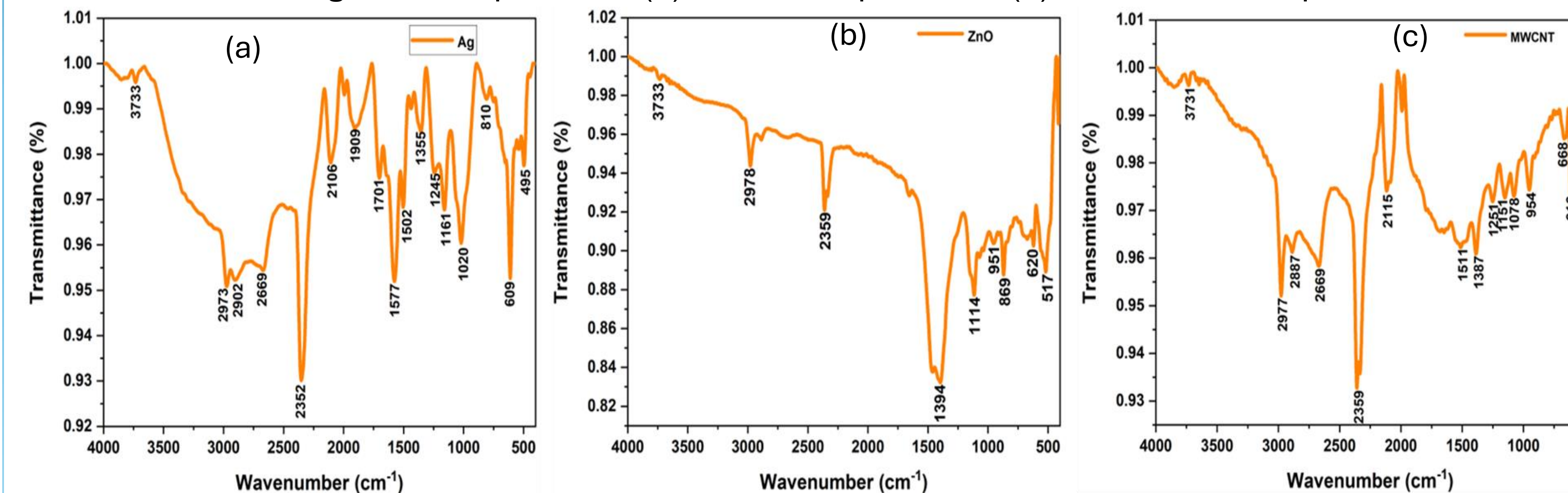


Fig 3. FTIR Spectra of, (a) Silver nanoparticles. (b) Zinc Oxide and (c) MWCNTs

ANALYSIS

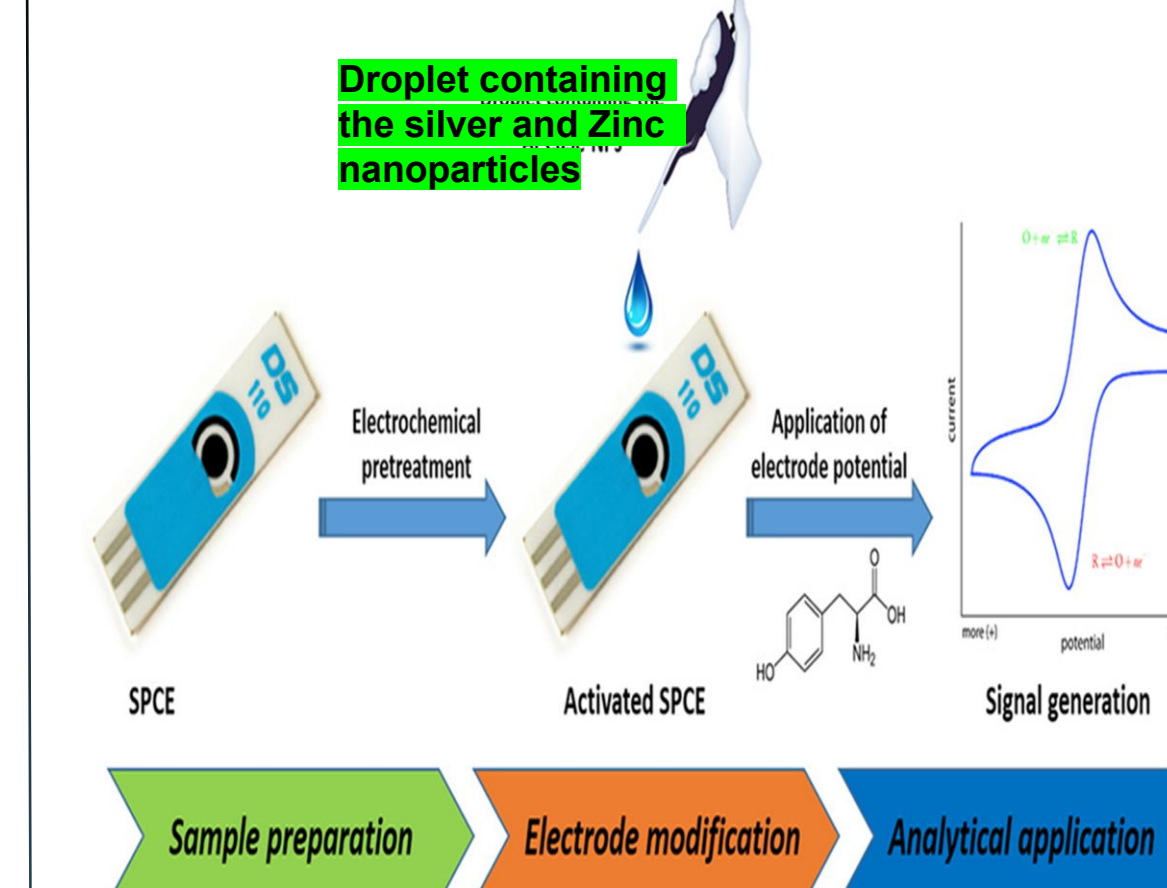


Fig 4. Modification of sensor with the synthesized Silver and Zinc Oxide

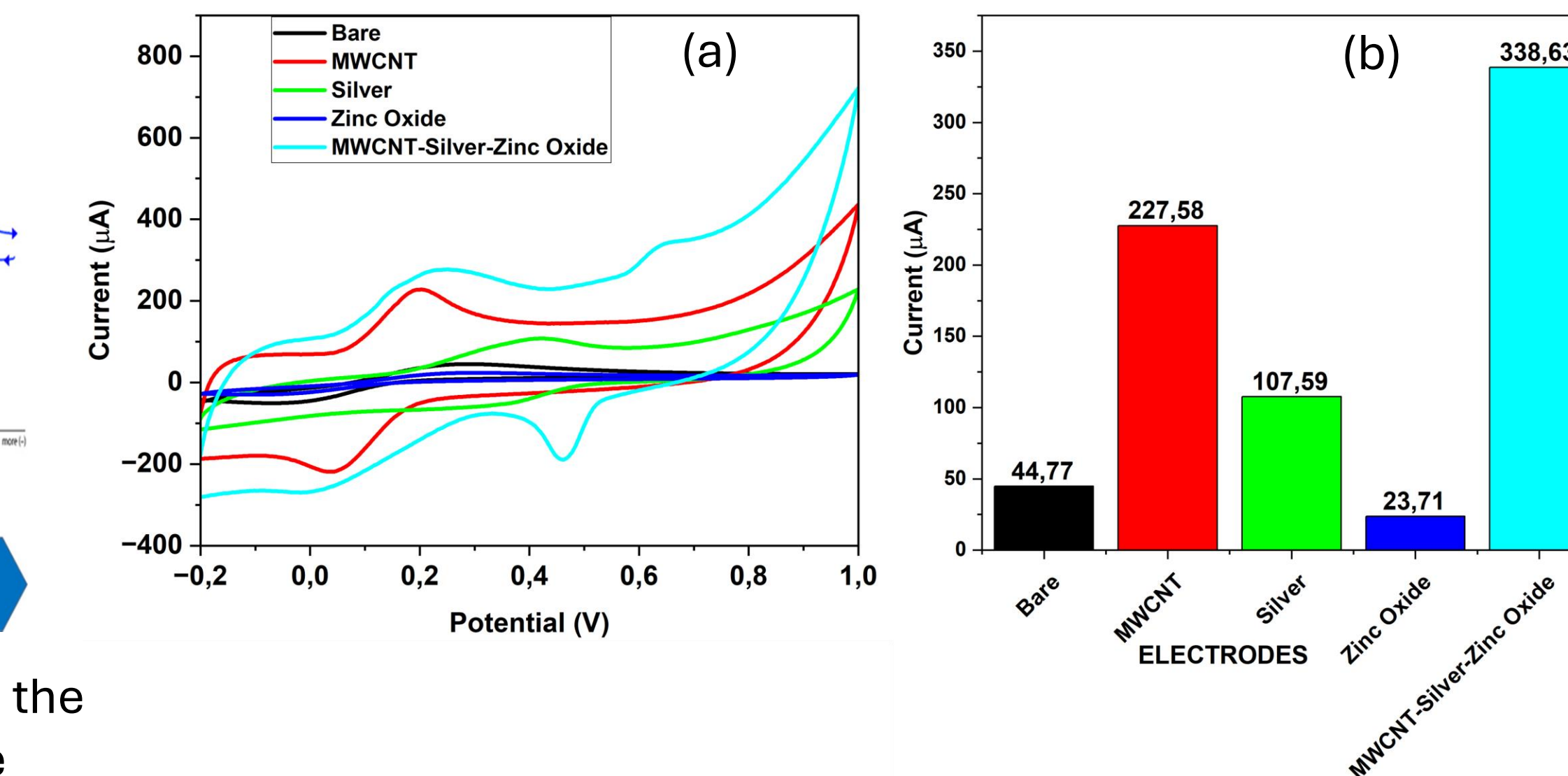


Fig 5. Electro-Analysis of Electrodes, (a). Bar graph of electrodes, (b).

CONCLUSION

- Successful synthesis of the nanoparticles was confirmed by crystallographic analysis as shown on Fig. 2 (a-b), and structural analysis on Fig. 3 (a-c),
- The nanoparticles were used to modify the sensor using a drop casting method in Fig.4,
- The sensor was electrochemically analyzed using cyclic voltammetry, an increase in the current response resulted with the modified sensor having a higher current response compared to the bare/unmodified electrode in Fig. 5 (a-b).

REFERENCES

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2. Piwowska, D., Kiedrzyńska, E. and Jaszczyszyn, K., 2024. A global perspective on the nature and fate of heavy metals polluting water ecosystems, and their impact and remediation. *Critical Reviews in Environmental Science and Technology*, 54(19), pp.1436-1458

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