



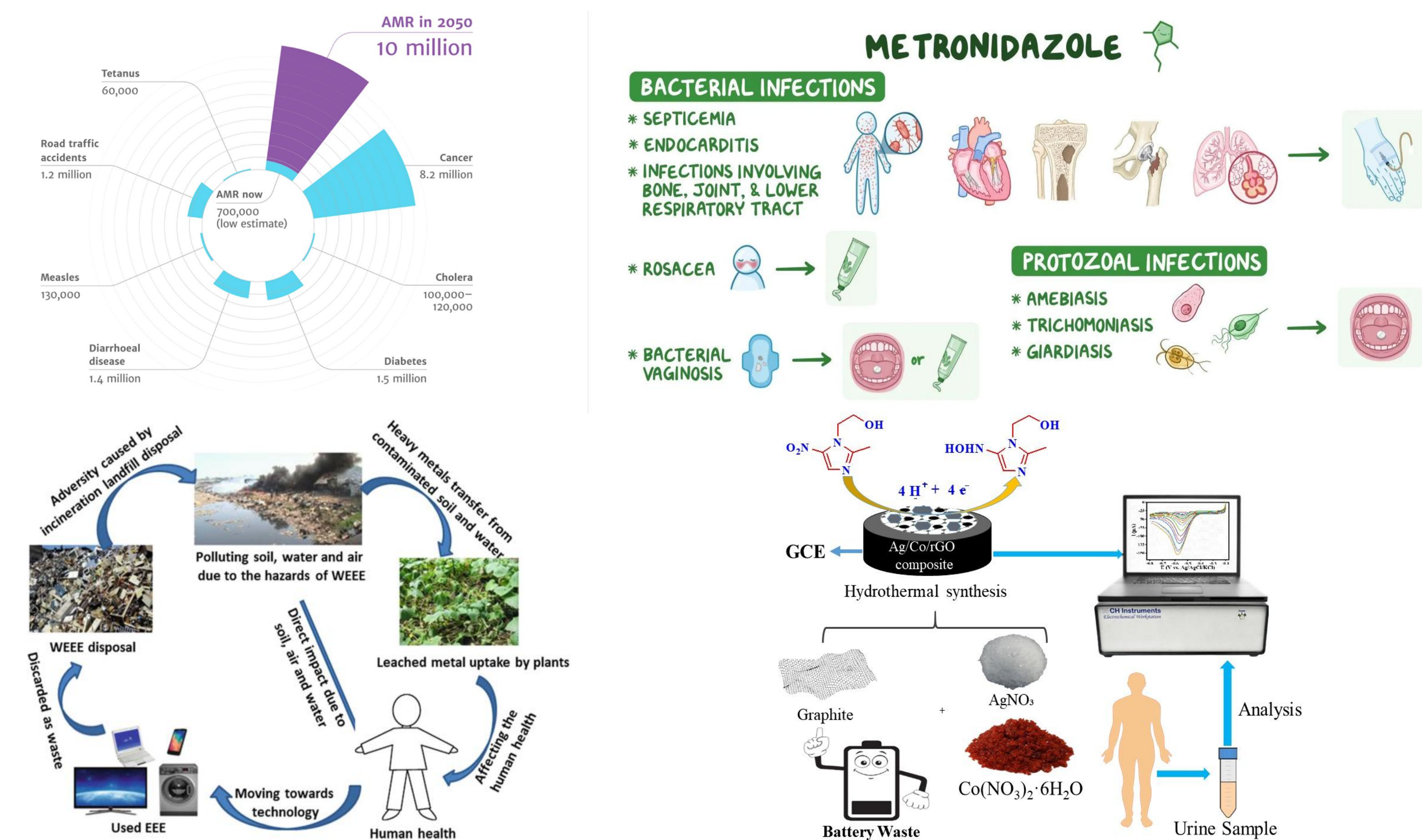
From E-Waste to Electrochemical Excellence: A Sustainable Ternary Nanohybrid Sensor for Ultra-Sensitive Metronidazole Detection

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INTRODUCTION



The overuse and misuse of antibiotics is creating drug-resistant bacteria, which could kill 10 million people yearly by 2050 and make common medical procedures dangerous. Metronidazole, a widely used antibiotic, adds to this problem by contaminating the environment when improperly disposed. Electronic waste creates pollution and health risks, but it also contains valuable materials like graphite from batteries. We solved both problems by turning battery waste into sensitive sensors that can detect metronidazole contamination in urine and other samples.

OBJECTIVES

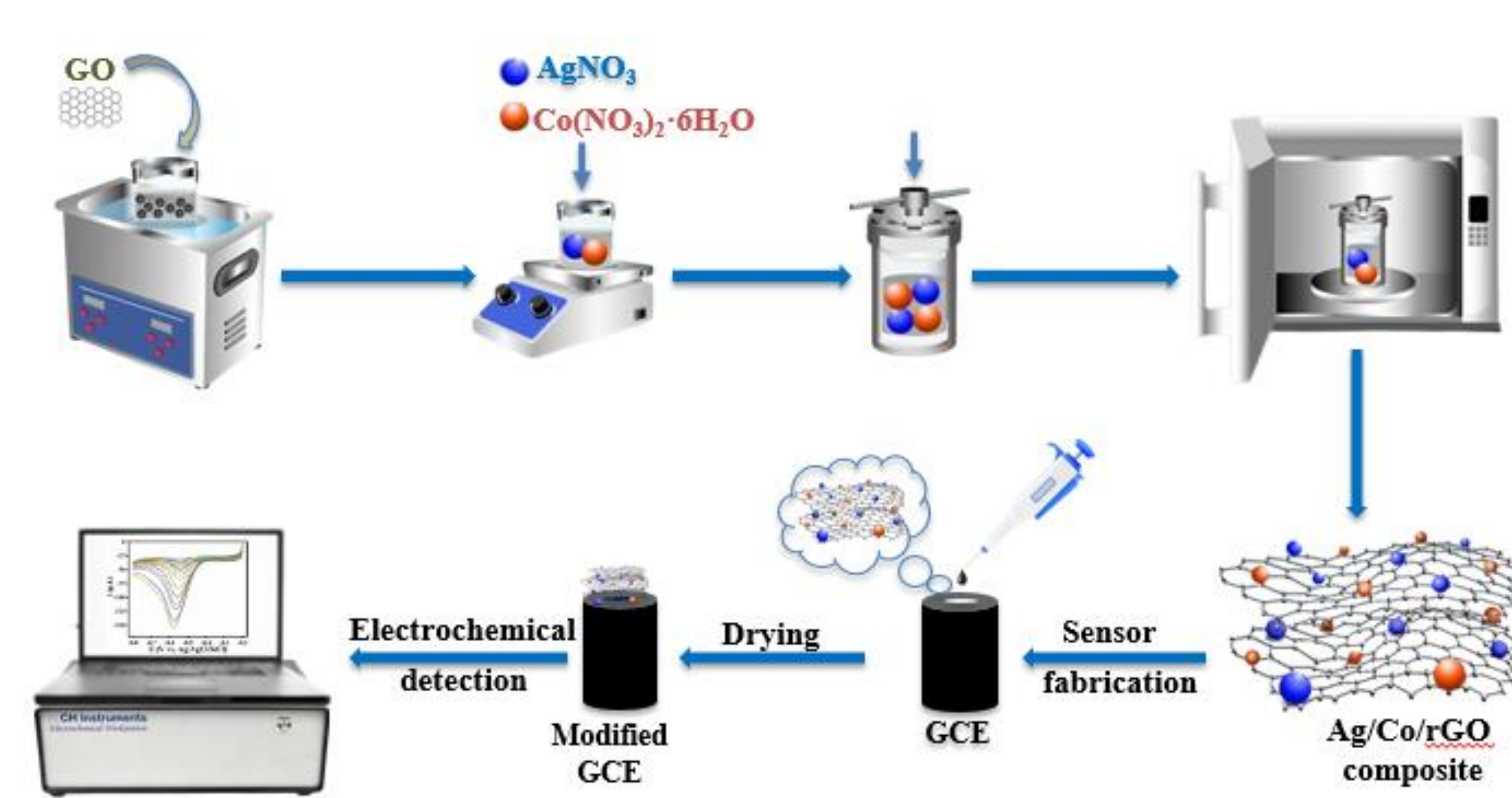
- Develop an e-waste-derived Ag/Co/rGO nanohybrid sensor.
- Evaluate its electrochemical performance for ultra-trace MTZ detection.
- Validate applicability in real biological and environmental samples.

CONNECTION WITH UN SDGs

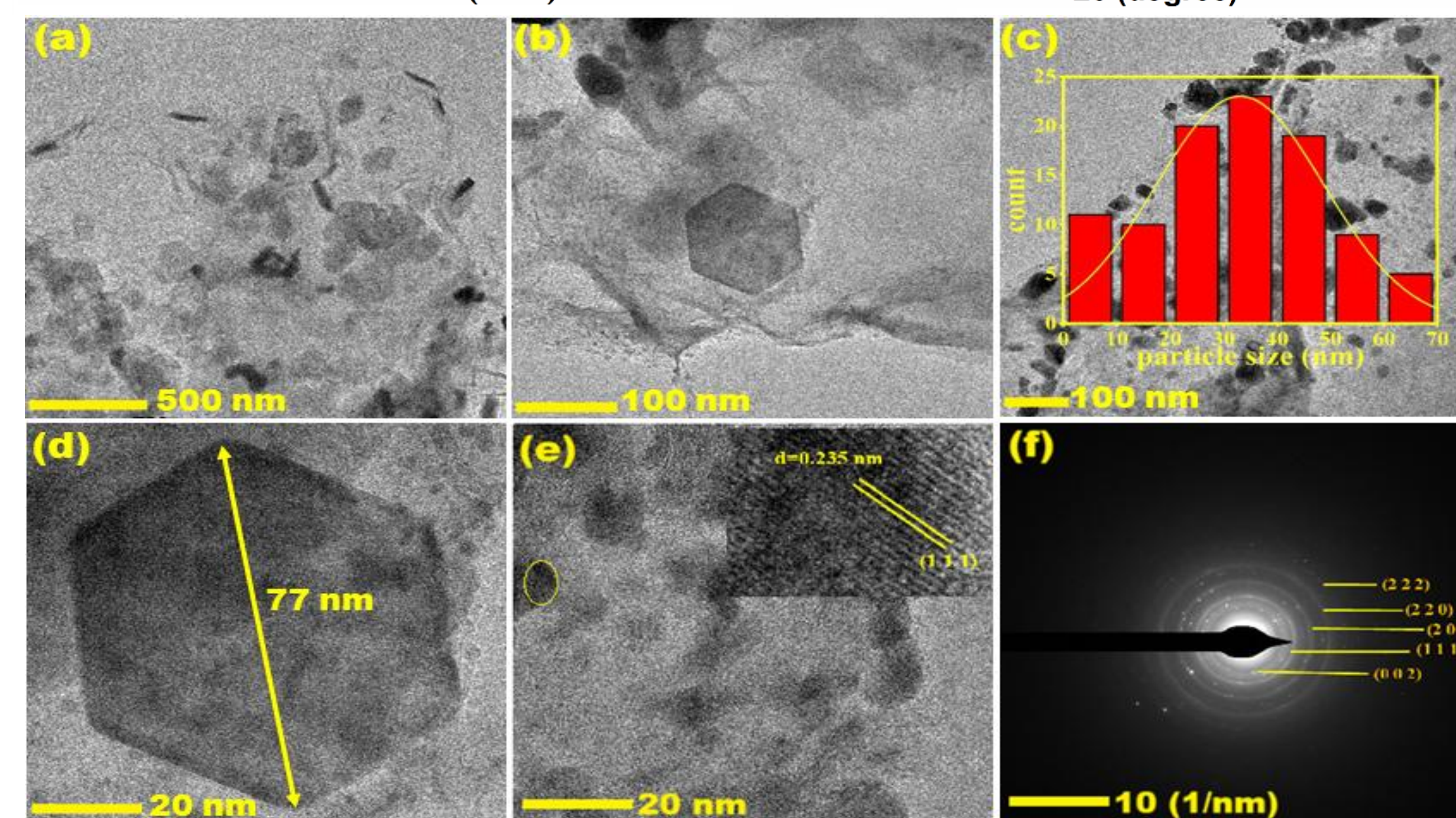
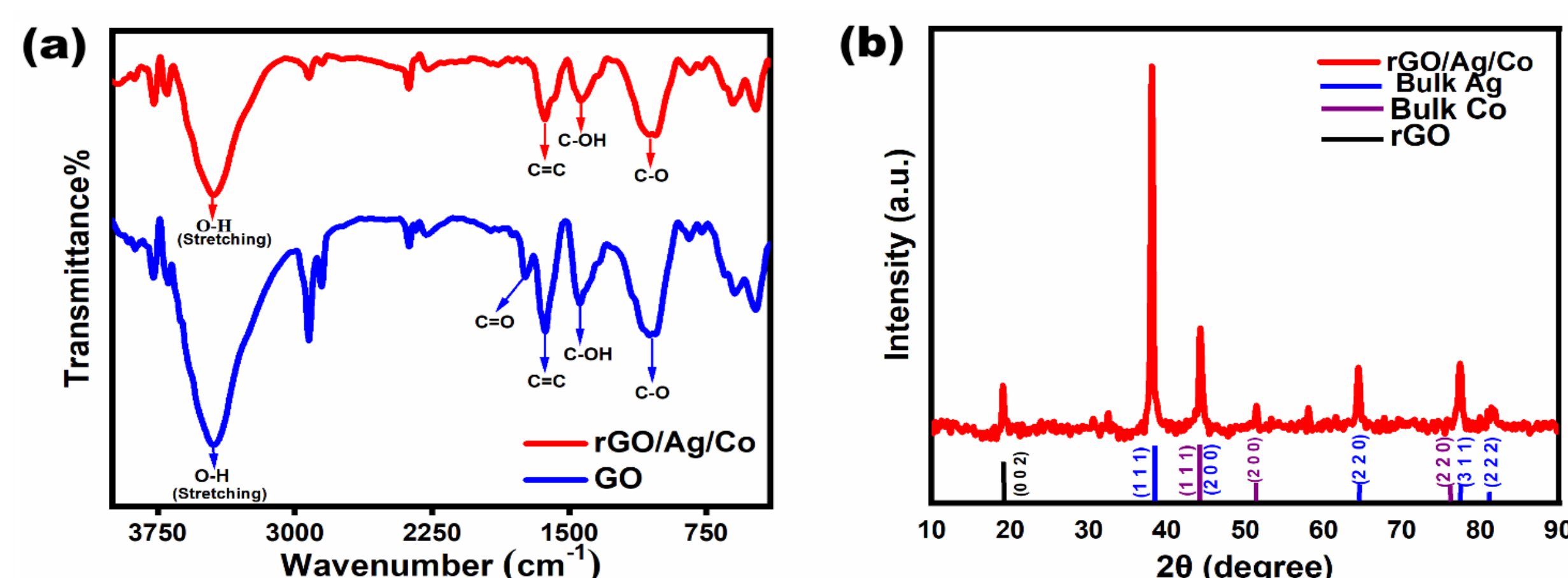


- **SDG 3:** Monitoring of metronidazole for public health.
- **SDG 6:** Detecting MTZ to protect water & ecosystems.
- **SDG 12:** Recycling e-waste into valuable nanomaterials

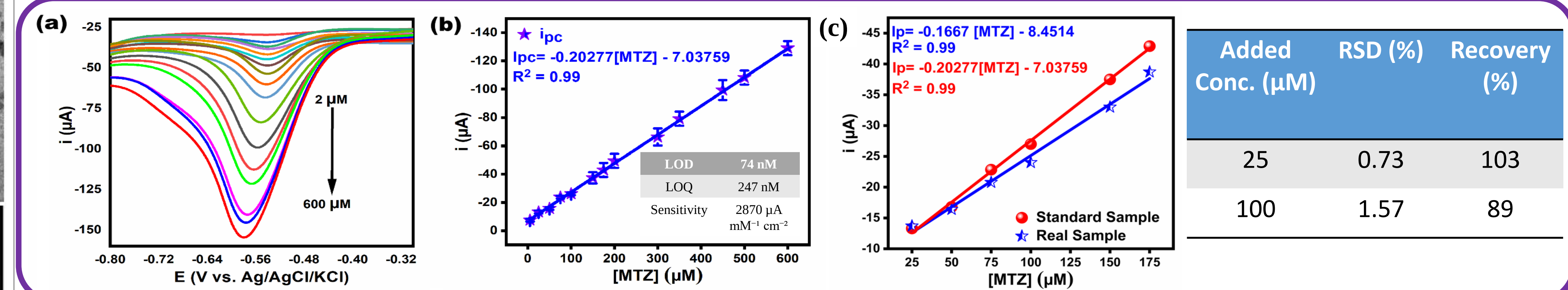
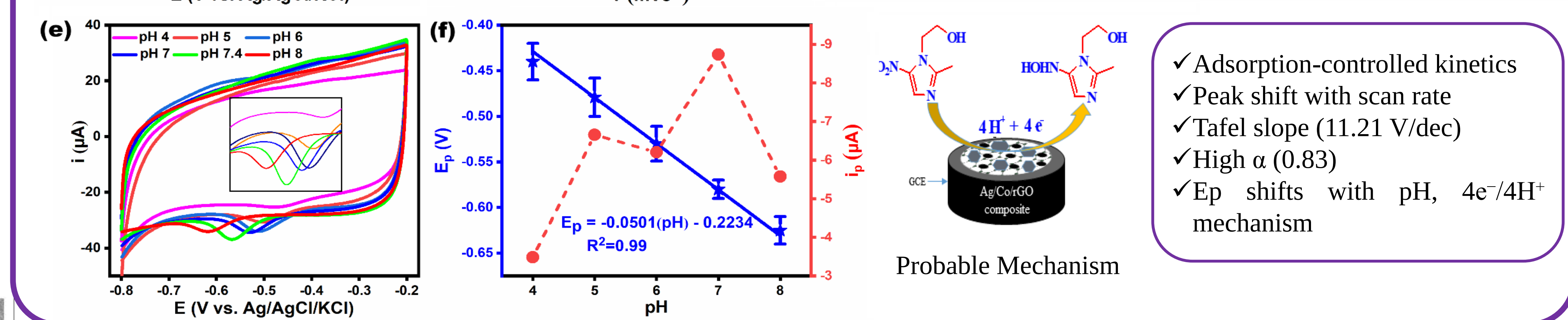
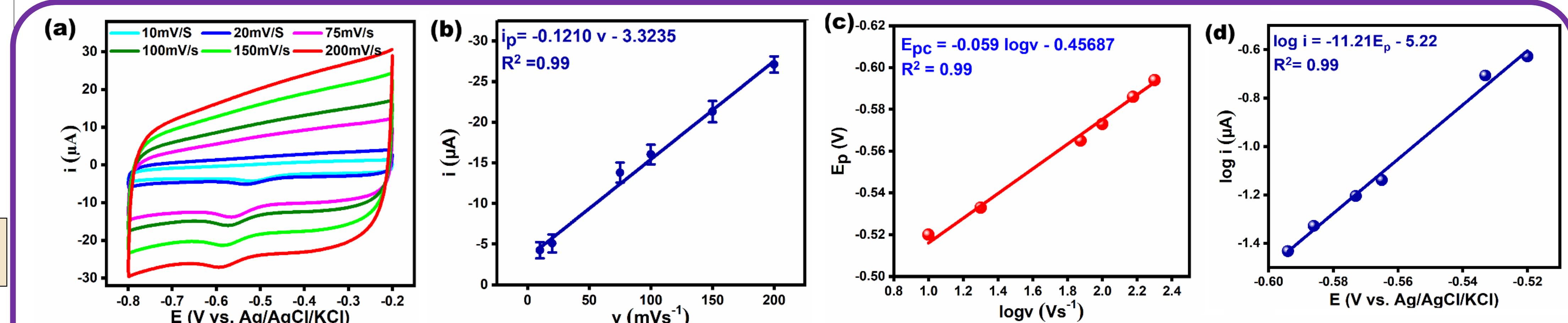
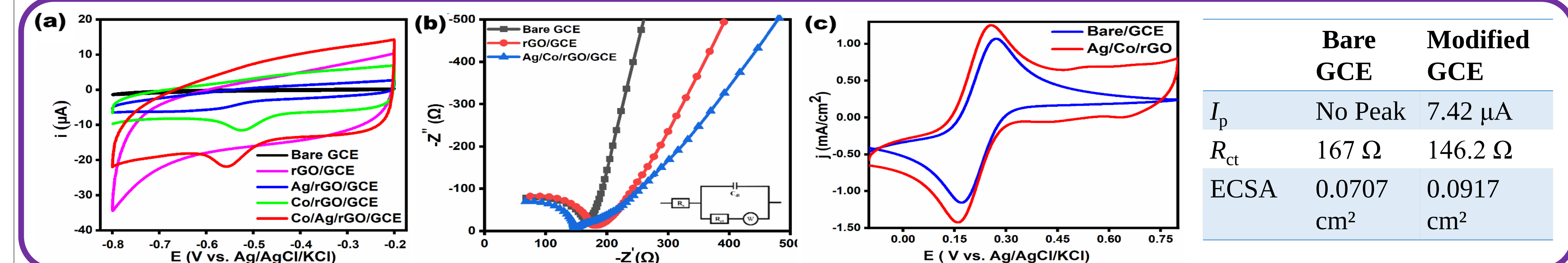
METHODOLOGY



CHARACTERIZATION



RESULTS AND DISCUSSION



CONCLUSION

Comprehensive characterization, kinetic and mechanistic studies, together with real-sample analysis, confirm the efficiency and practical applicability of our e-waste-derived sensor for metronidazole detection