

INTRODUCTION



According to The International Diabetes Federation **10.5%** of the adult population are diabetic, among which nearly half the population are ignorant that they might live with that condition

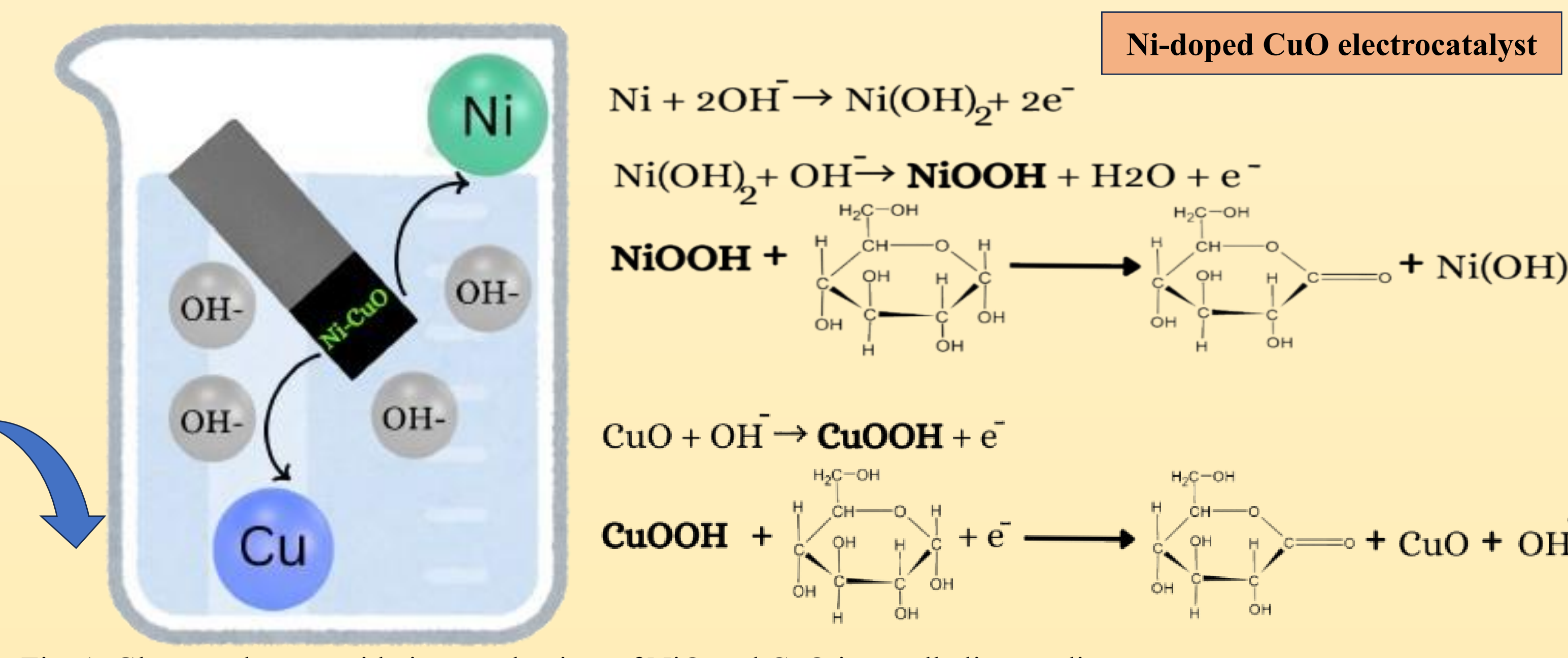
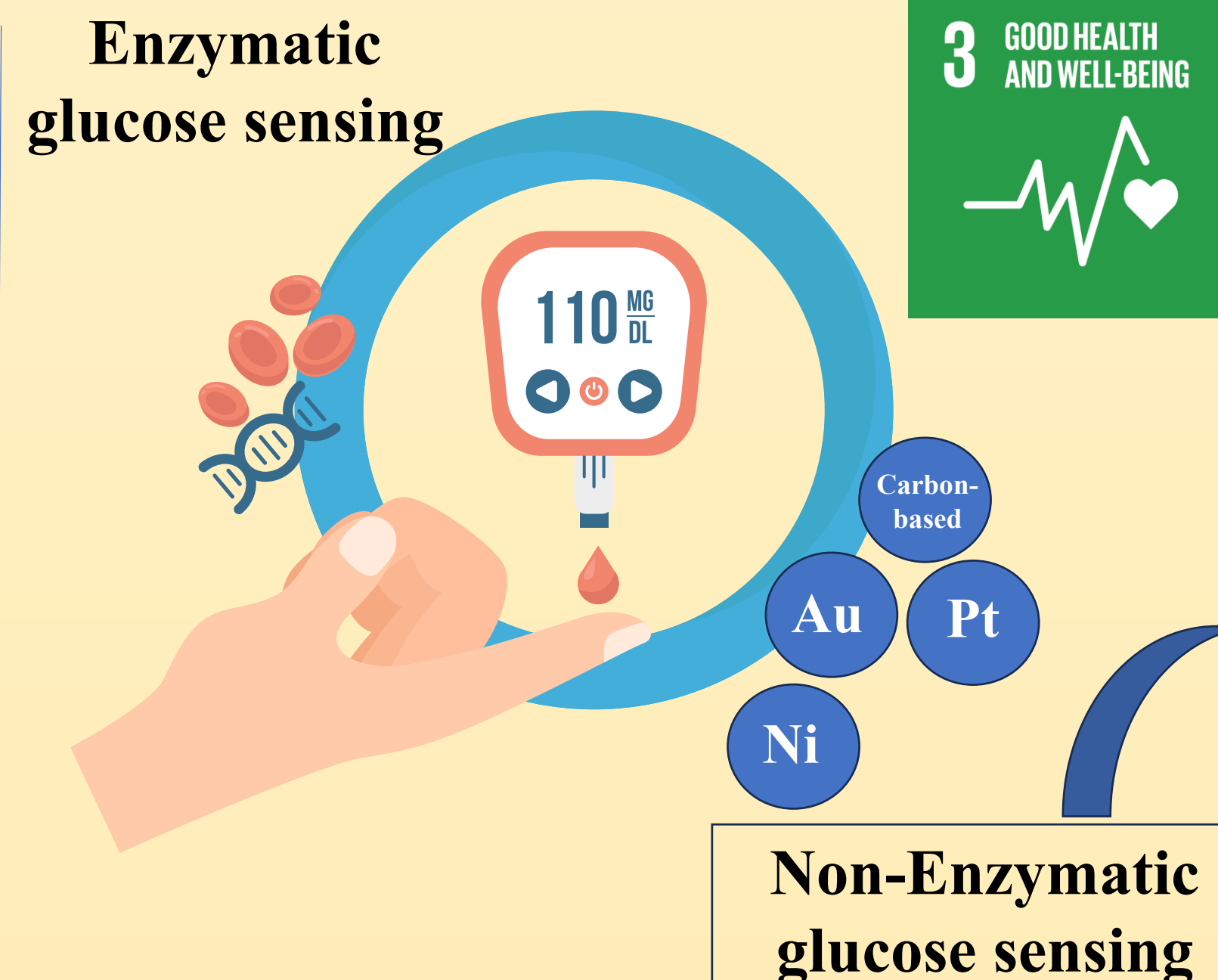
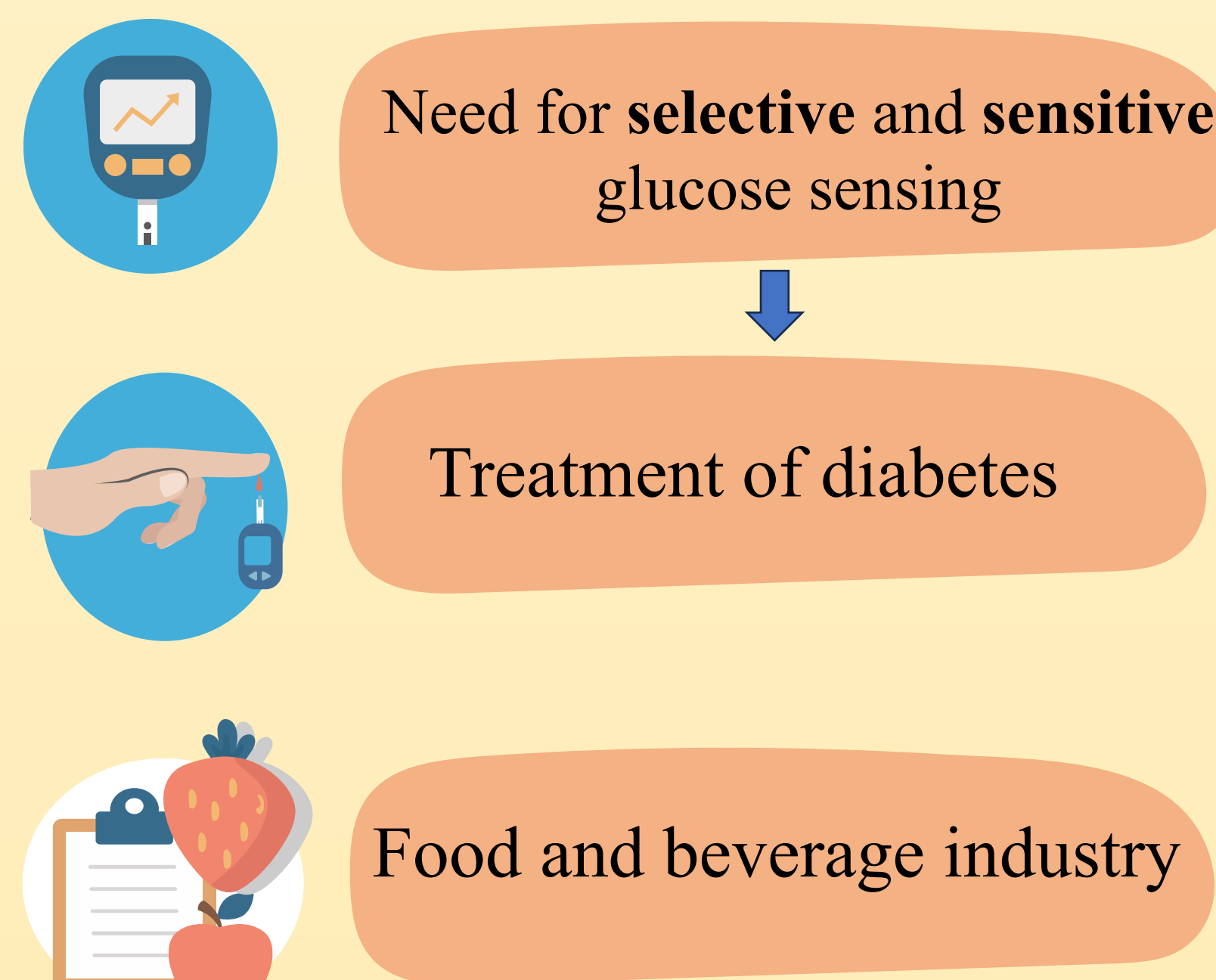


Fig. 1. Glucose electro-oxidation mechanism of NiO and CuO in an alkaline medium

METHODOLOGY

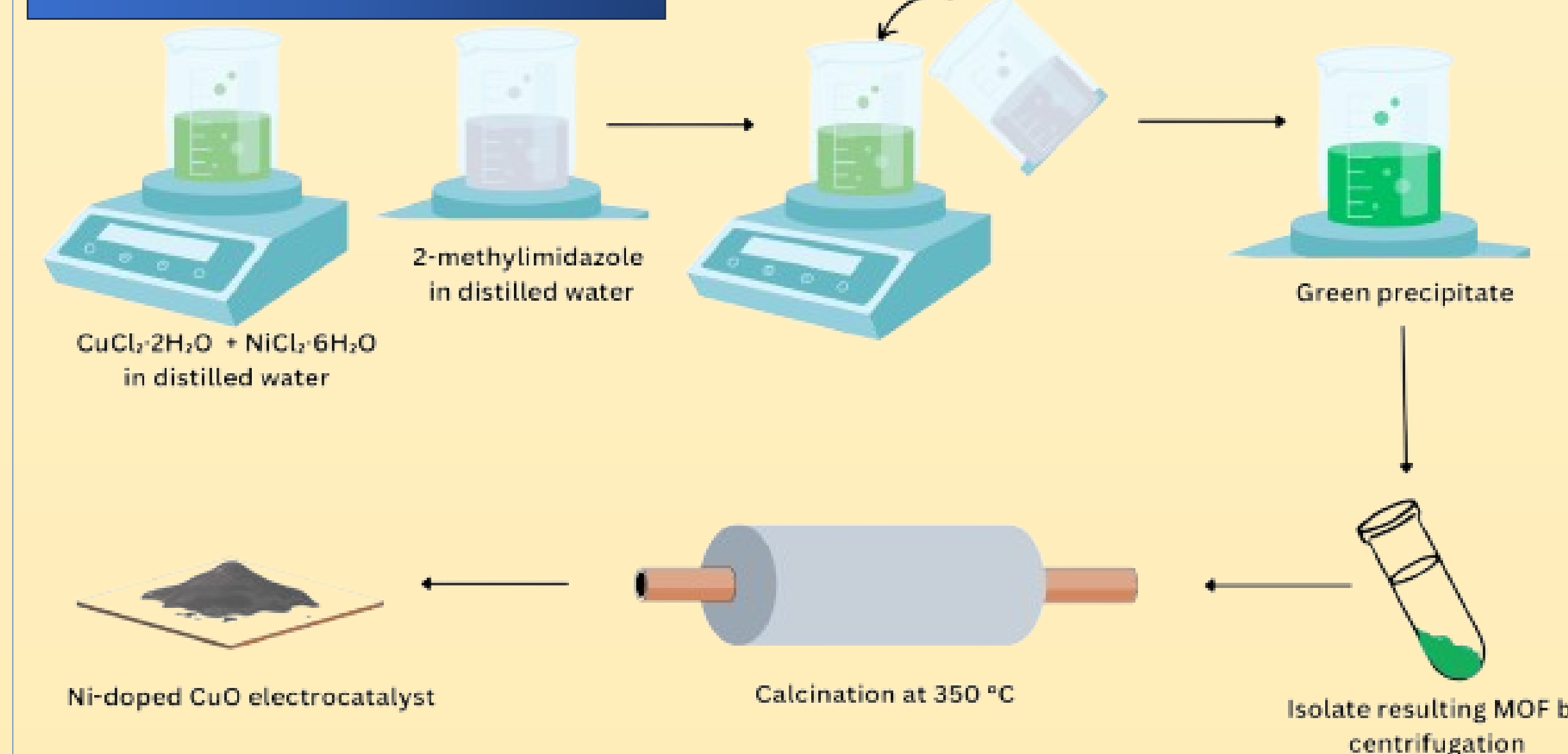


Fig. 2. Schematic representation method of synthesizing Ni-doped CuO electrocatalyst

PHYSICO-CHEMICAL CHARACTERIZATION

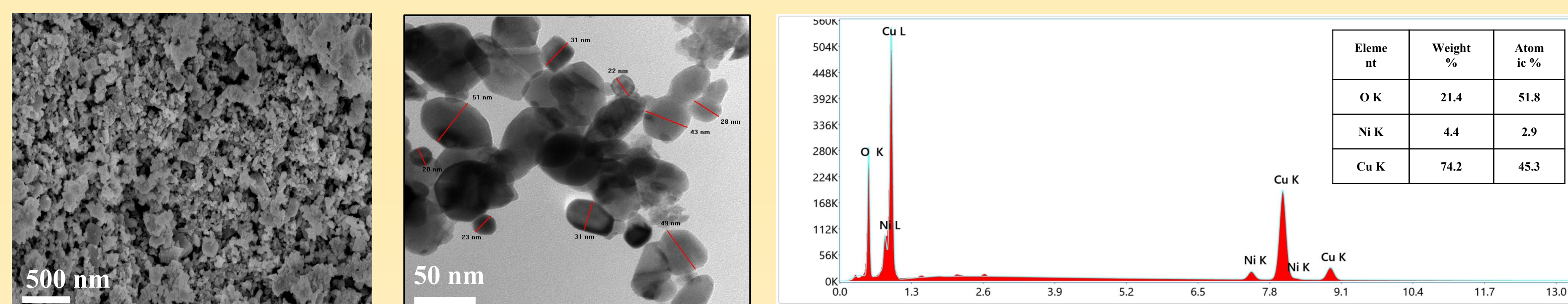


Fig. 3(a) Scanning Electron Microscopy image of Ni-doped CuO

Fig. 3(b) Transmission Electron Microscopy image of Ni-doped CuO

Fig. 4. Energy dispersive X-ray spectra of Ni-doped CuO

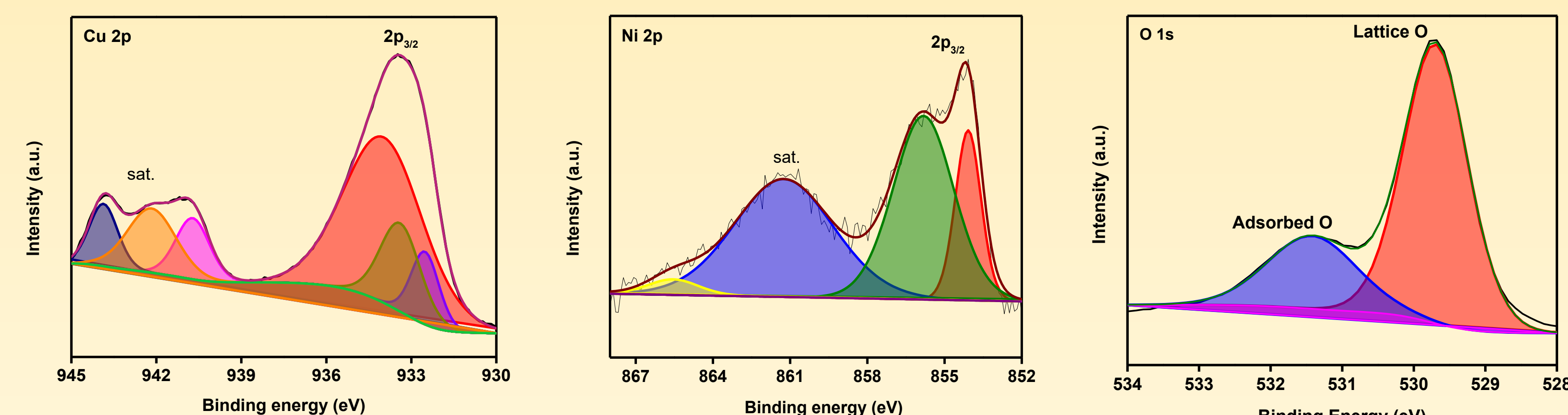


Fig. 5(a) High resolution deconvoluted XPS spectra of Cu 2p

Fig. 5(b) High resolution deconvoluted XPS spectra of Ni 2p

Fig. 5(c) High resolution deconvoluted XPS spectra of O 1s

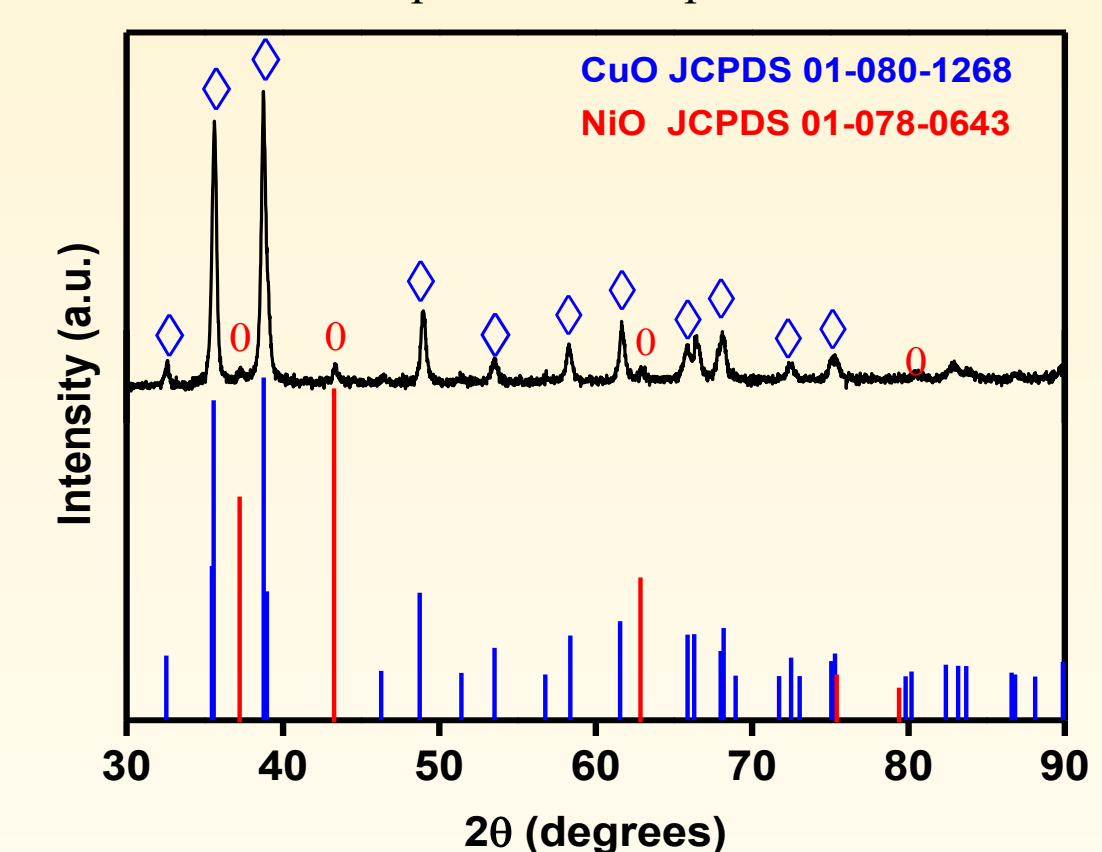


Fig. 6. X-ray diffraction patterns of Ni-doped CuO

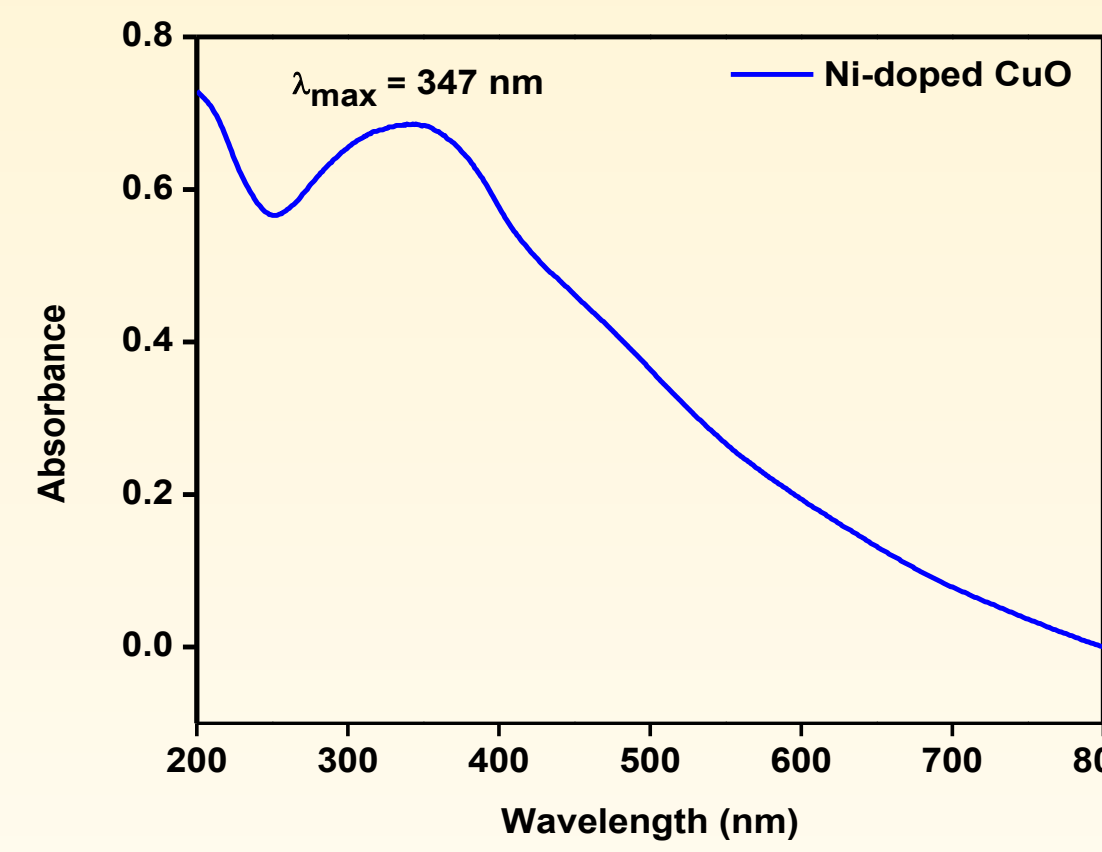


Fig. 7(a) UV-Visible spectra

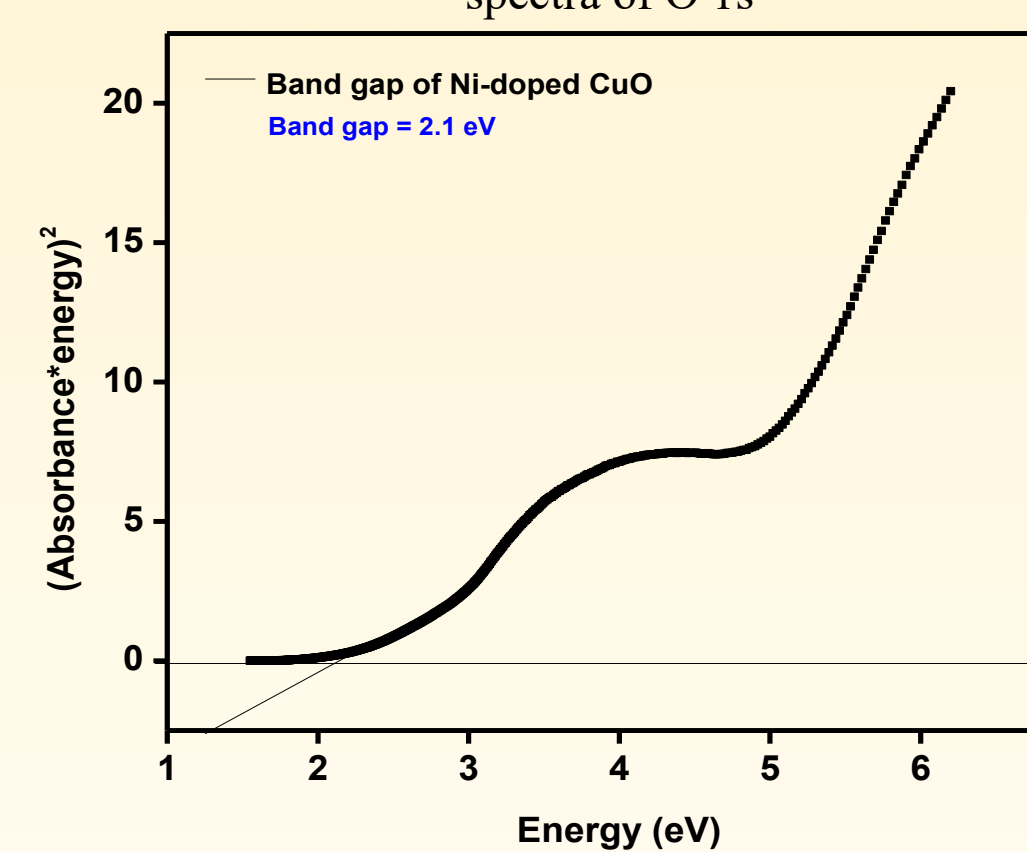


Fig. 7(b) Tauc plot of Ni-CuO electrocatalyst

ELECTROCHEMICAL EVALUATION

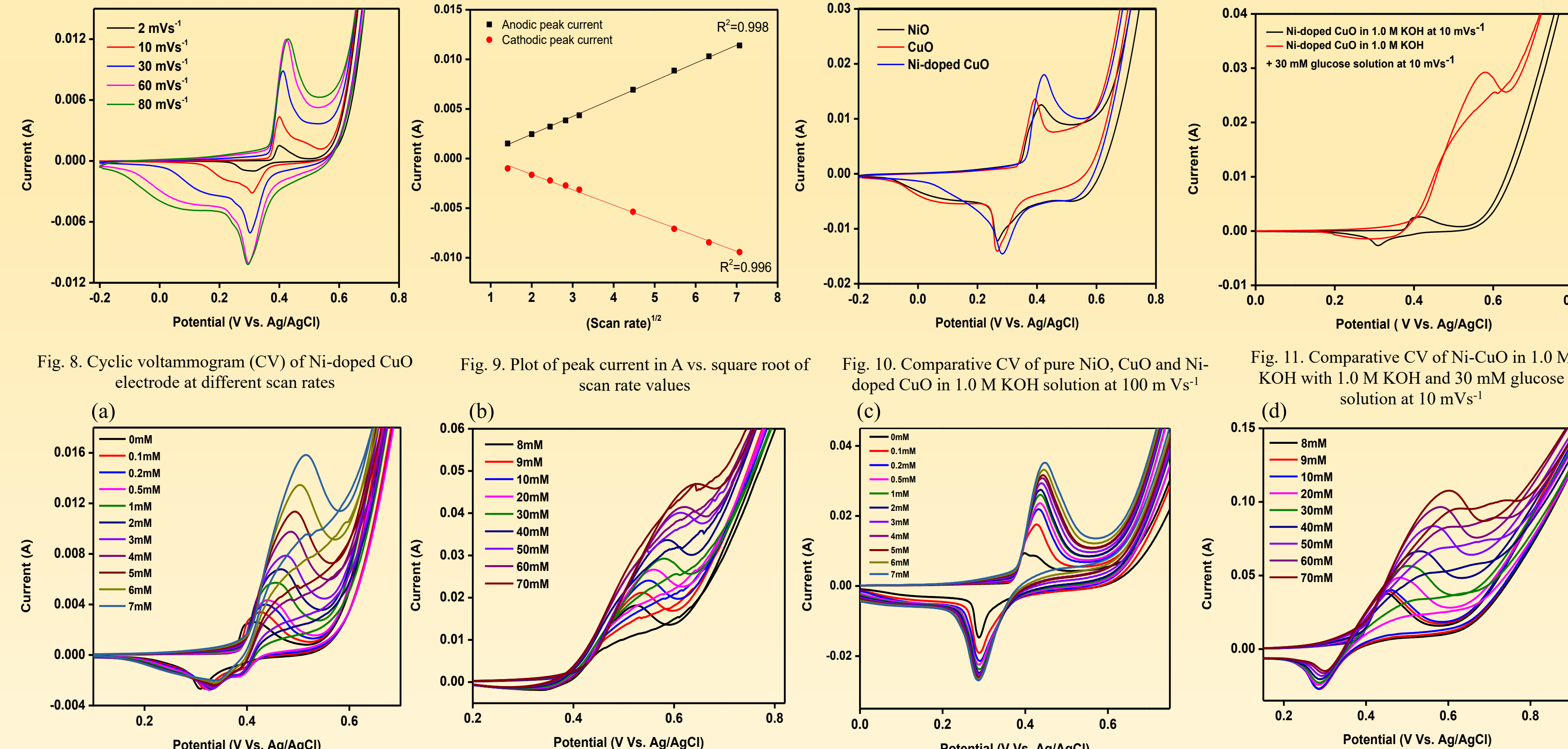


Fig. 8. Cyclic voltammogram (CV) of Ni-doped CuO electrode at different scan rates

Fig. 9. Plot of peak current in A. vs. square root of scan rate values

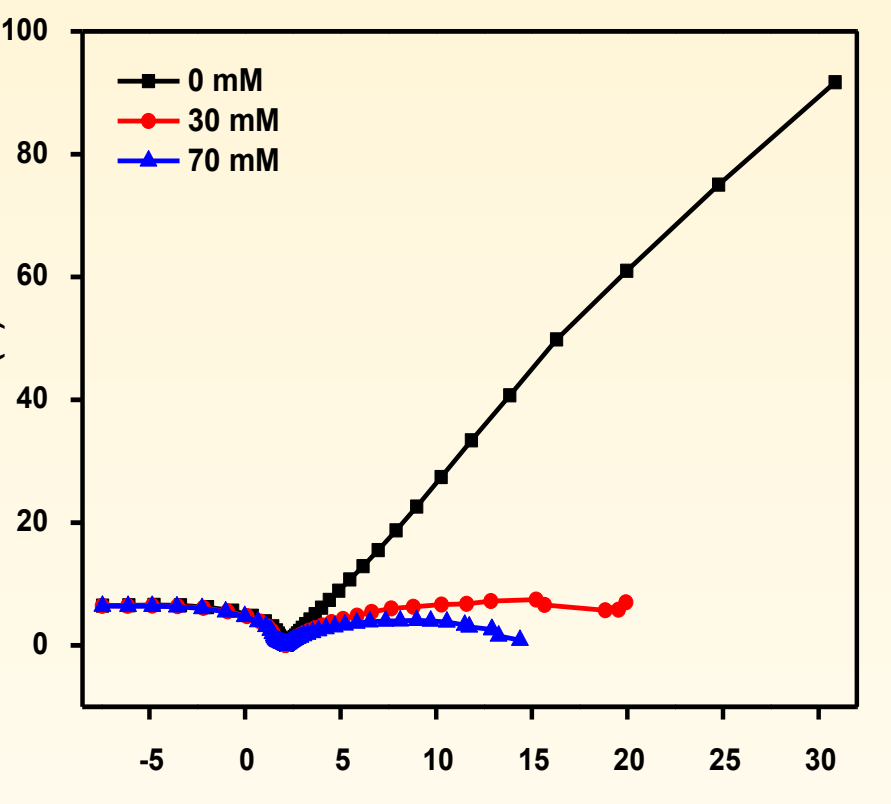
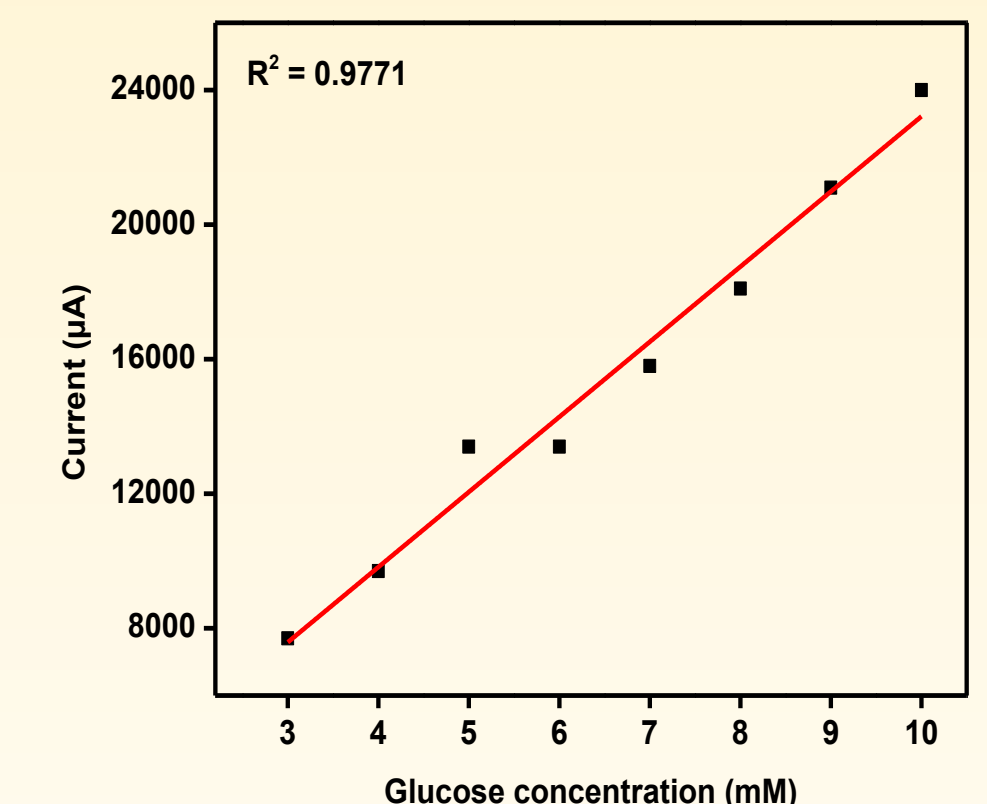
Fig. 10. Comparative CV of pure NiO, CuO and Ni-doped CuO in 1.0 M KOH solution at 100 mV s⁻¹Fig. 11. Comparative CV of Ni-CuO in 1.0 M KOH with 1.0 M KOH and 30 mM glucose solution at 10 mV s⁻¹Fig. 12a and 12b. Comparative CV of different concentrations at 10 mV s⁻¹Fig. 12c and 12d. Comparative CV of different concentrations at 100 mV s⁻¹

Fig. 14. Comparative Nyquist plot of Ni-CuO electrode at three different concentrations of glucose

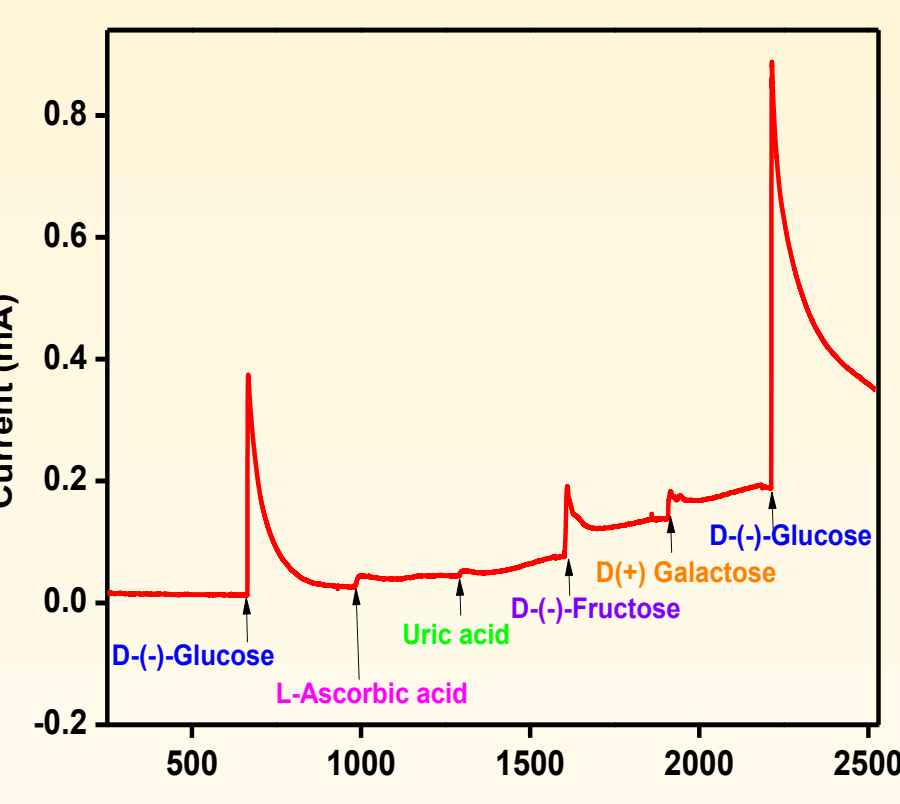


Fig. 15. Amperometric response of the Ni-CuO electrode towards 1 mM Glucose, 1 mM of interfering species and 2 mM of glucose

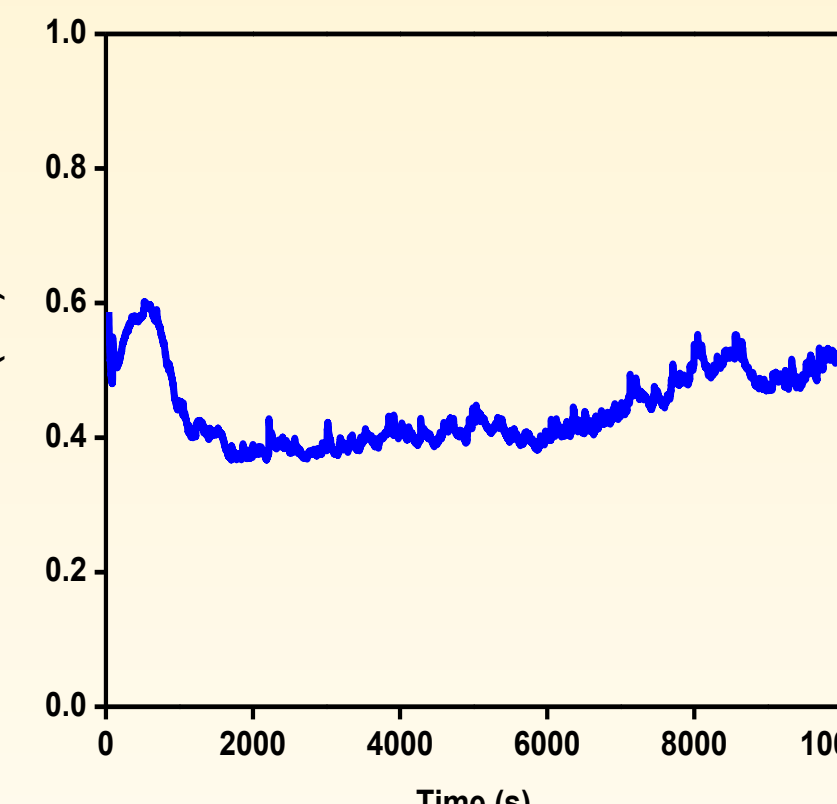
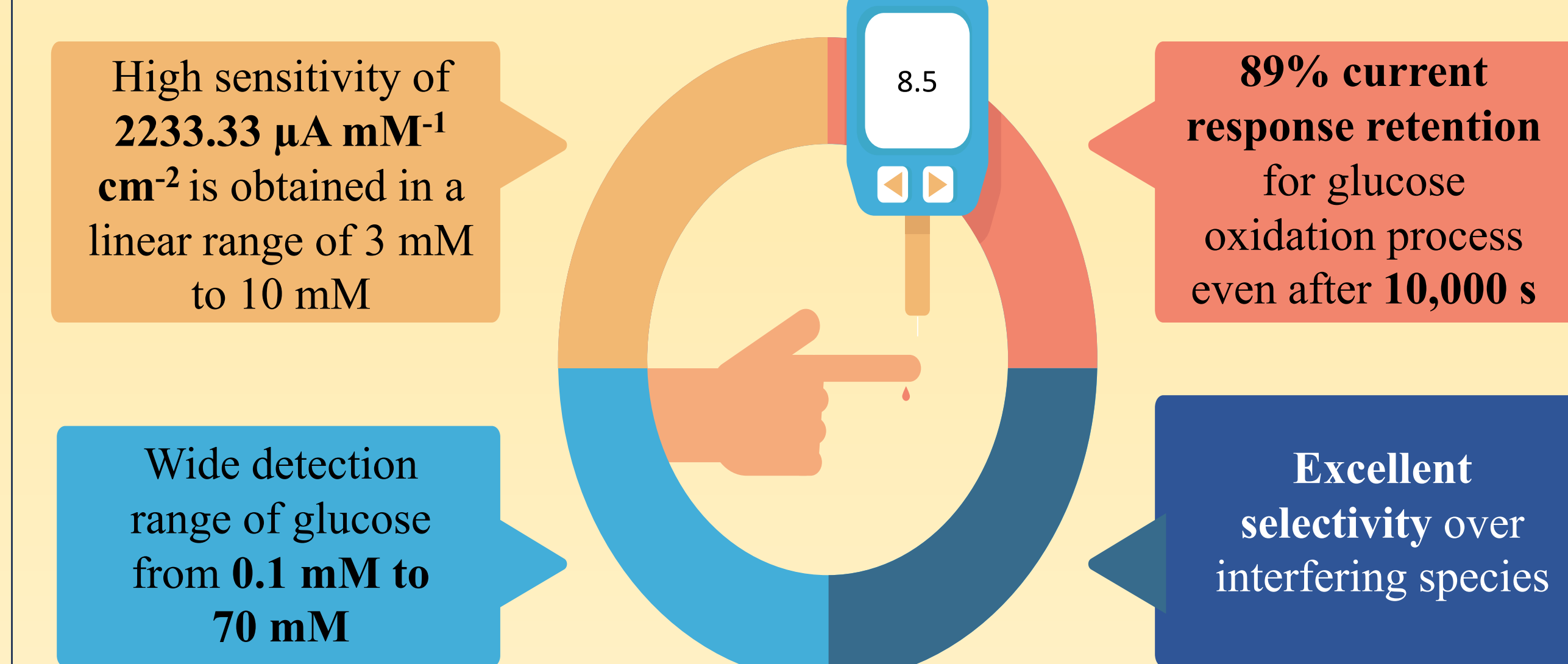


Fig. 16. Stability of the Ni-CuO electrode tested by chronoamperometry for 10000 s.

CONCLUSION



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