Supplementary Information

α-Ni(OH)$_2$@DEHP nanoparticles for fabrication of non-enzymatic electrochemical glucose sensor

Kainat I Shaikh, Shabnam Khatoon, Mritunjay S Tiwari, Arun K Kadu*, and Suresh D Pawar*

Department of Chemistry, University of Mumbai, Mumbai-400 098, India.

***Corresponding authors**

Email: sureshpawar@chemistry.mu.ac.in

kadu.arun@chemistry.mu.ac.in

Electrochemical characterization of modified electrodes

Redox scan rate study

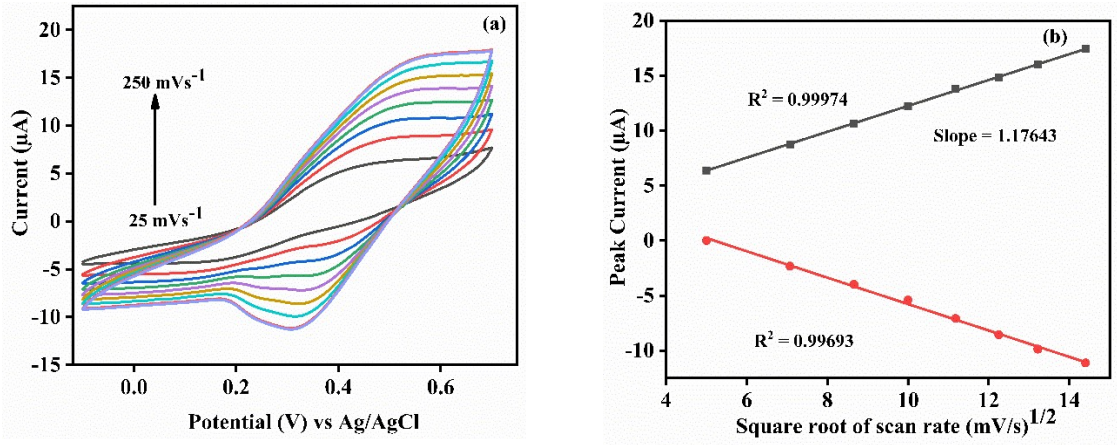

Fig.S1. (a) CV curves obtained at different scan rates for 10% α-Ni(OH)$_2$@DEHP/ CPE using 5 mM redox in 0.1 M KCl. (b) Plot of peak current I_p [A] vs. square root of scan rate [$\upsilon^{1/2}$ (mV s^{-1})$^{1/2}$].

Electro-catalytic response of modified electrodes towards glucose

Glucose scan rate study

The kinetics of glucose oxidation by 10% α-Ni(OH)$_2$@DEHP/CPE were investigated by obtaining CVs of electrodes in 1 M NaOH containing 3 mM glucose at various scan rates in the range of 25 mV s^{-1} to 250 mV s^{-1} (Fig. S2 a). The anodic peak current and cathodic peak current increases with increasing potential, with a slight shifting of peak potential as the redox reaction is boosted by increasing scan rate(Fig. S2 b). Shifting of peaks is observed as the electrolytic contact between the sensing electrode and electrolyte decreases due to the generation of intermediate species formed by continued redox reactions on the surface of the electrode, resulting in the formation of a layer of intermediate products on the surface of the sensing electrode. Fig. S2. (a), (b) shows that the mechanism of electro-oxidation of glucose by 10% α-

$Ni(OH)_2$@DEHP/CPE in an alkaline medium is diffusion control, as anodic/cathodic peak current vs. square root of scan rate ($\upsilon^{1/2}$) shows linear relation with each other with correlation coefficients of 0.99797 and 0.999607, respectively.

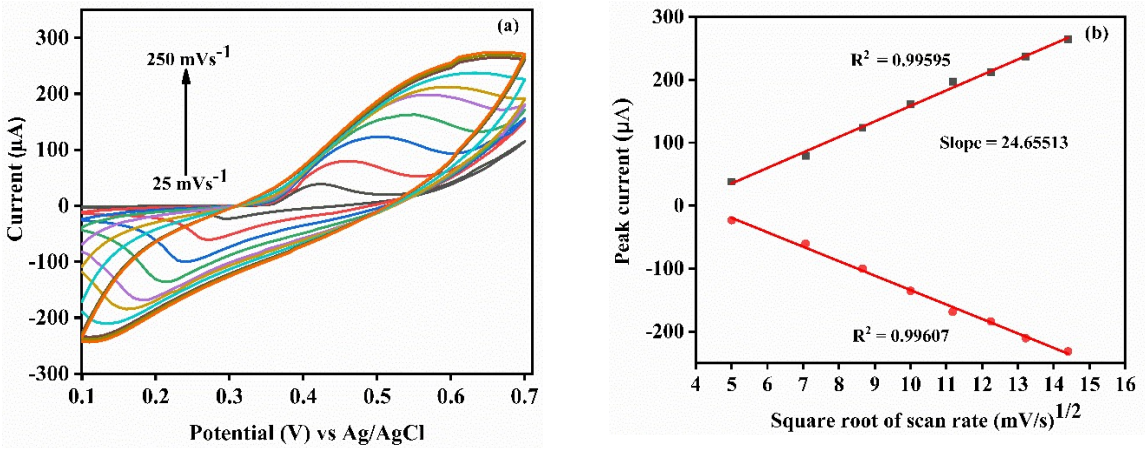

Fig. S2 (a) CV curves at different scan rates from 25 mV s^{-1} to 250 mV s^{-1} at 10% α-$Ni(OH)_2$@DEHPA/CPE using 3 mM glucose in 1 M NaOH. (b) The plot of peak current I_p [µA] vs square root of scan rate [$\upsilon^{1/2}$(mV s^{-1})$^{1/2}$] in the range of 25 mV s^{-1} to 250 mV s^{-1}.