Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Information

Ultrasensitive and highly selective non-enzymatic glucose sensor based on $CoNi_2Se_4$ /rGO nanocomposite

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Electrochemically Active Surface Area (ECSA):

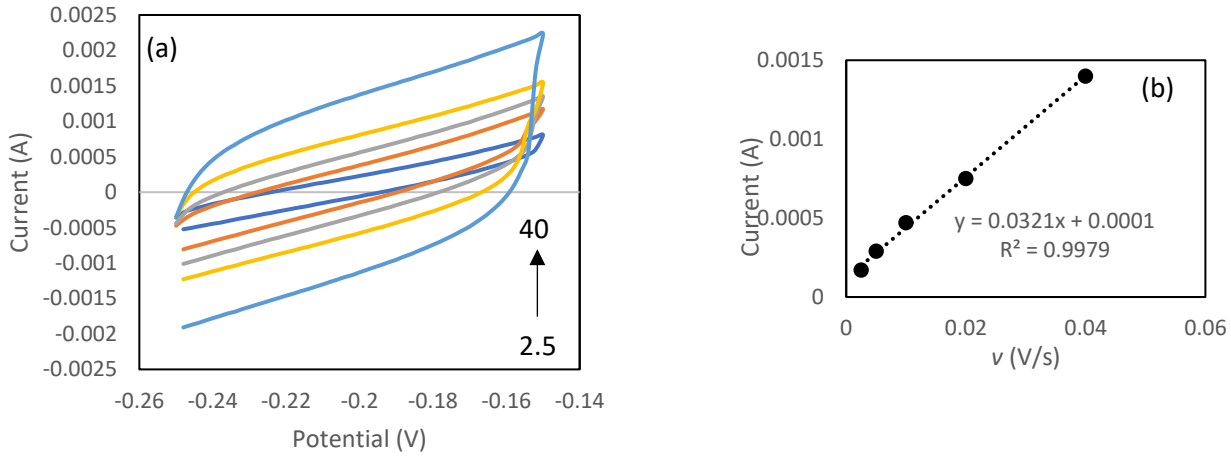

Fig. S1 Electrochemically active surface area analysis of (a) $CoNi_2Se_4$-rGO@NF at different scan rates, (b) linear fitting of capacitive currents vs. scan rate.

Surface Characterizations

SEM and EDS

A FEI Helios Nanolab 600 FIB/FESEM at an acceleration voltage of 10 kV and a working distance of 5.0 mm was employed to obtain SEM image of the modified electrode surfaces. Energy dispersive spectroscopy (EDS) accompanied by line scan analysis was also acquired from the SEM microscope.

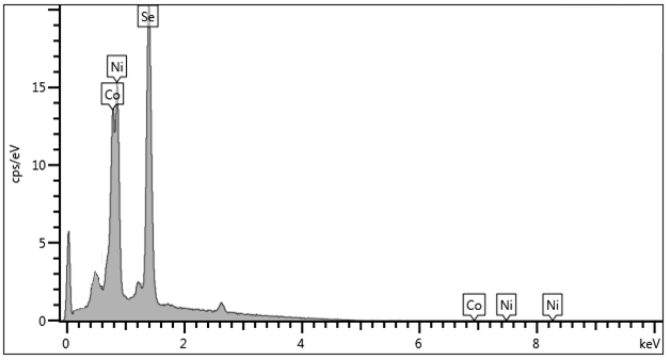

Fig. S2 EDS of $CoNi_2Se_4$ on Ni Foam

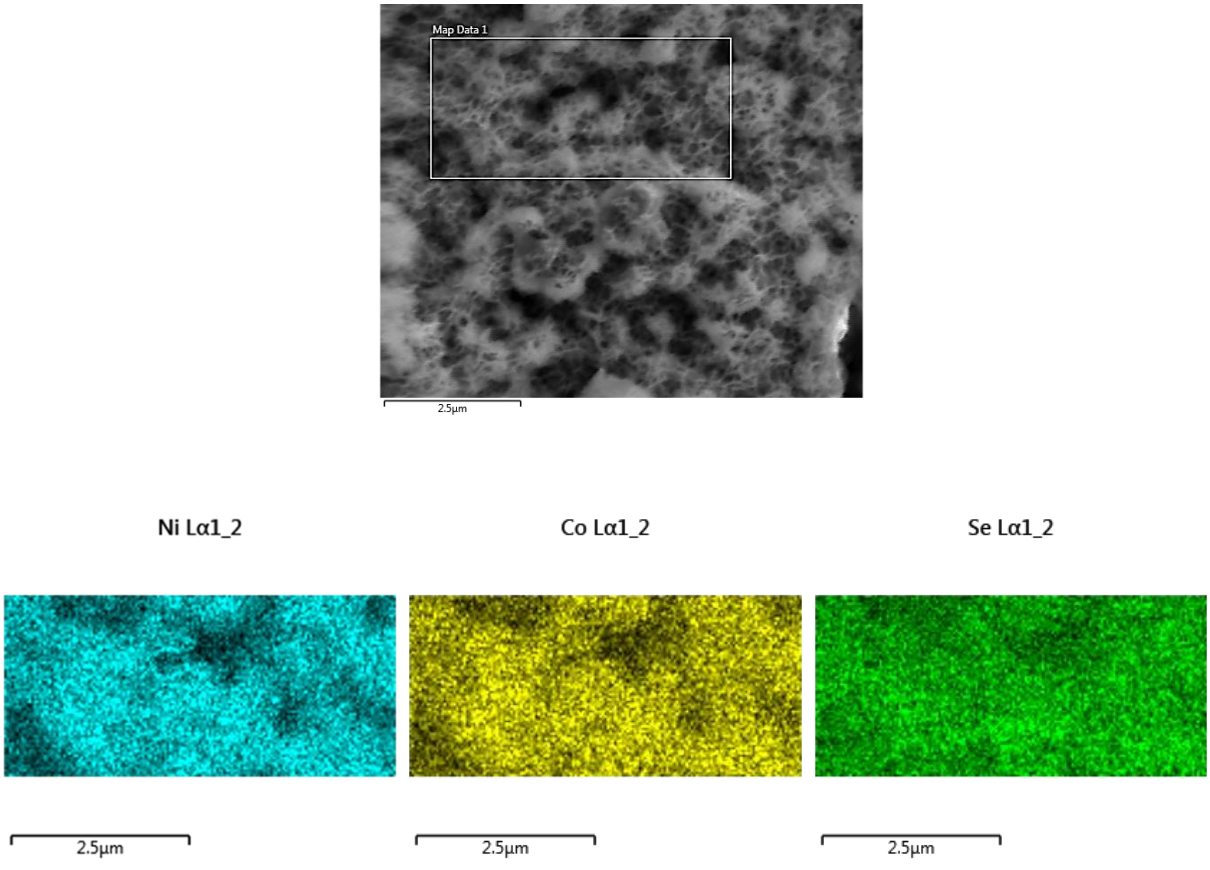

Fig. S3 Elemental mapping of $CoNi_2Se_4$ on Ni Foam

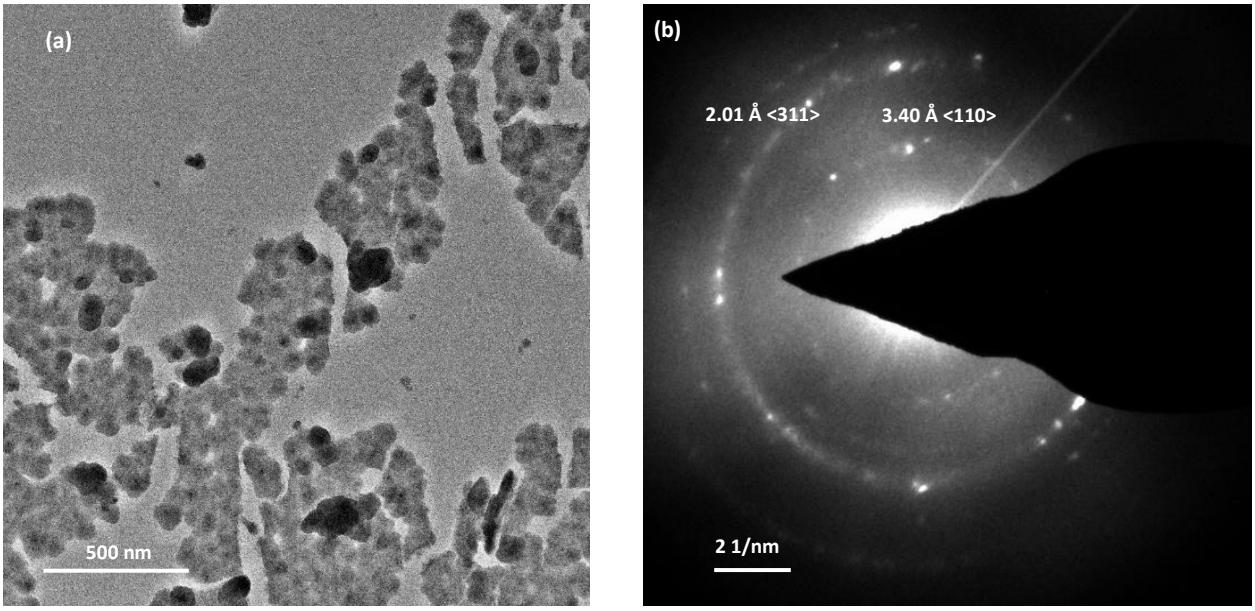

Fig. S4 TEM image (a) and SAED pattern (b) of $CoNi_2Se_4$ catalyst.

XPS

KRATOS AXIS 165 X-ray Photoelectron Spectrometer using monochromatic Al X-ray source was used for all XPS measurements of the catalyst.

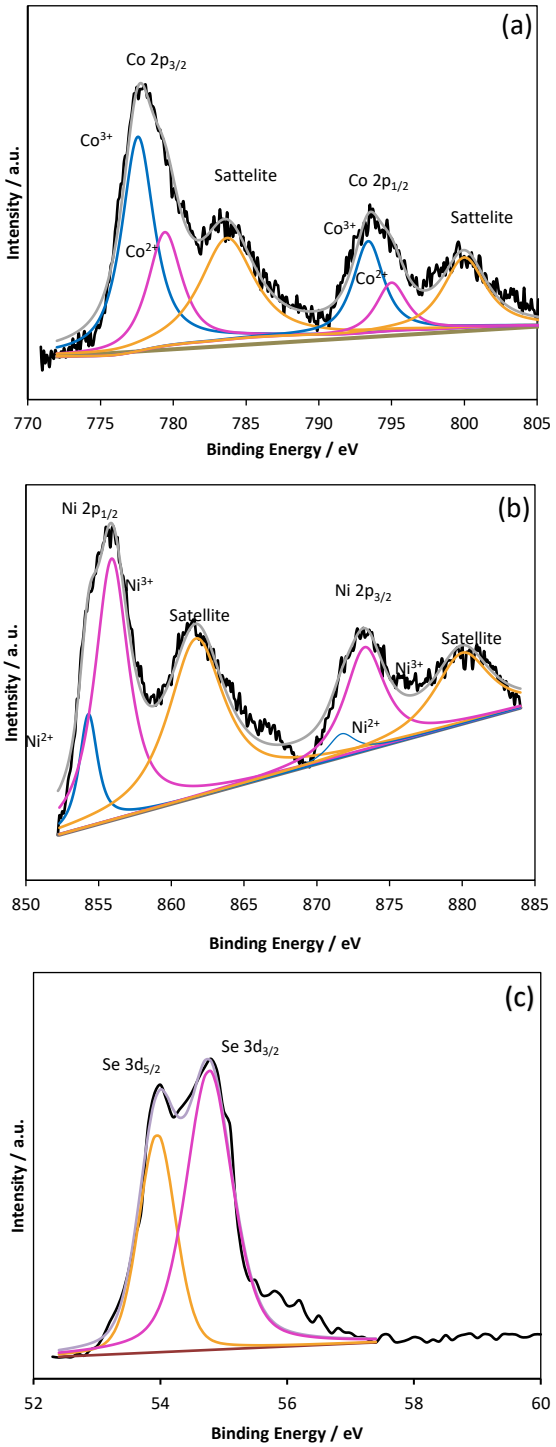

Fig. S5 XPS of as-synthesized $CoNi_2Se_4$-rGO (Ni 2p, Co 2p and Se 3d).

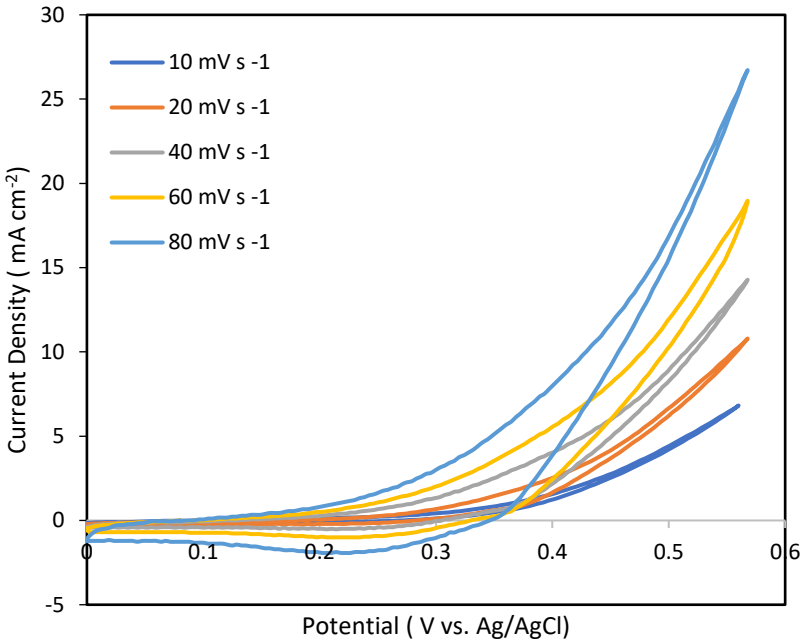

Fig. S6 Cyclic voltammetry of reduced graphene oxide on Ni Foam at various scan rates at presence of 0.1 mM glucose.

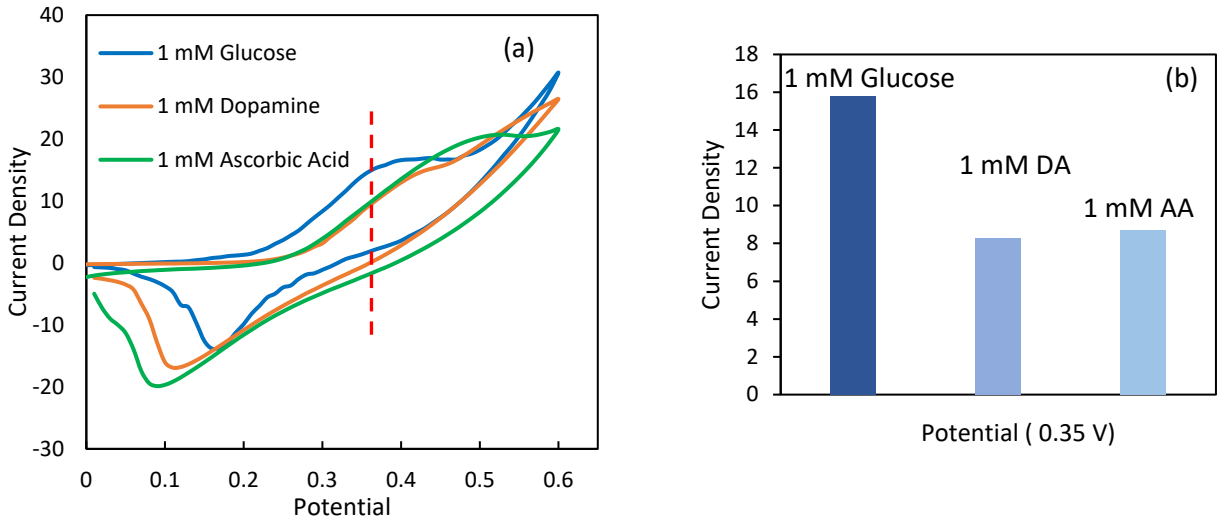

Figure S7. (a) CVs of $CoNi_2Se_4$-rGO@NF in presence of 1mM of Dopamine, ascorbic acid and glucose solution separately at the same potential (0.35 V) (b) current densities at 0.35 V for 1 mM glucose, 1mM dopamine or 1 mM ascorbic acid solutions. Current densities in both plots are in mA/cm^2.

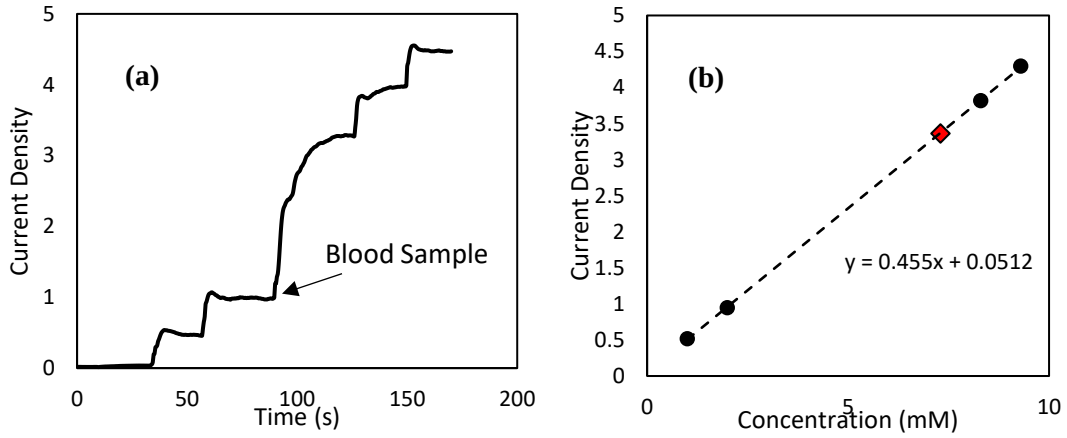

Fig. S8 A typical electrochemical measurement for blood glucose determination performed through (a) amperometric response of $CoNi_2Se_4$-rGO@NF upon the addition of blood sample in 0.05 M NaOH at an applied potential of 0.35 V vs Ag|AgCl. Current density is in mA/cm^2. (b) estimating the glucose level from the fitted linear plot of current response vs glucose concentration.