Electronic Supplementary Information

Non enzymatic electrochemical sensing platform based on metal complex immobilized carbon nanotubes for glucose determination†

Piyush Kumar Sonkar[1], Vellaichamy Ganesan[1]*, S. Abraham John[2]*,

Dharmendra Kumar Yadav[1] and Rupali Gupta[1]

1. Department of Chemistry, Institute of Science, Banaras Hindu University,

Varanasi-221005, Uttar Pradesh, India

2. Department of Chemistry, Gandhigram Rural Institute,

Gandhigram-624302, Tamil Nadu, India

† Electronic supplementary information (ESI) available

* Corresponding authors

V. Ganesan: Tel.: +91-9452072138 (Mobile), Fax: +91-542-2368127, E-Mail:

velganesh@yahoo.com and velgan@bhu.ac.in

S. A. John: Tel.: +91-9443504981(Mobile), E-Mail: abrajohn@gmail.com

Table S1 Comparison of IR peak positions of salophen, Ni^{II}-S, MWCNT and MWCNT-Ni^{II}-S materials

Material	**IR frequencies (cm^{-1})**				
	C=N	**C-C, C=C**	**C-O**	**-OH**	**>C=O**
salophen	1612	1581, 1471	1276	3430	-
Ni^{II}-S	1609	1563, 1476	1285	-	
MWCNT	-	1600	-	3432	1719
MWCNT-Ni^{II}-S	1609	1581	-	3430	1710

Table S2 Composition of MWCNT and MWCNT-Ni^{II}-S obtained from EDAX.

Material	**Elements**	**Series**	**wt%**	**Error (1 sigma wt %)**
MWCNT	C	K-series	88.06	12.01
	O	K-series	7.43	2.27
MWCNT-Ni^{II}-S	C	K-series	87.95	13.82
	O	K-series	2.56	2.79
	N	K-series	6.77	3.31
	Ni	K-series	2.72	0.17

Table S3 Percentage change in the oxidation current in presence of various interfering compounds (200.0 µM) for the determination of 200.0 µM of glucose at GC/MWCNT-Ni^{II}-S in 0.1 M NaOH.

Interferents tested	**Percentage change in current for the glucose oxidation**	**Level of interference***
Uric acid	0.2	Negligible
Cysteine	0.4	Negligible
H_2O_2	5.0	Negligible
Fructose	8.5	Moderate
Sucrose	8.8	Moderate
Ascorbic acid	9.2	Moderate
Glycine	9.8	Moderate
Dopamine	16.2	Serious
Paracetamol	6.4#	Moderate

*Interference range: 0-5% =No/negligible, 5-10% =Moderate, >10% =Serious interference

#based on CV.

Scheme 1. Schematic representation of the formation of polymeric Ni^{II}-S.

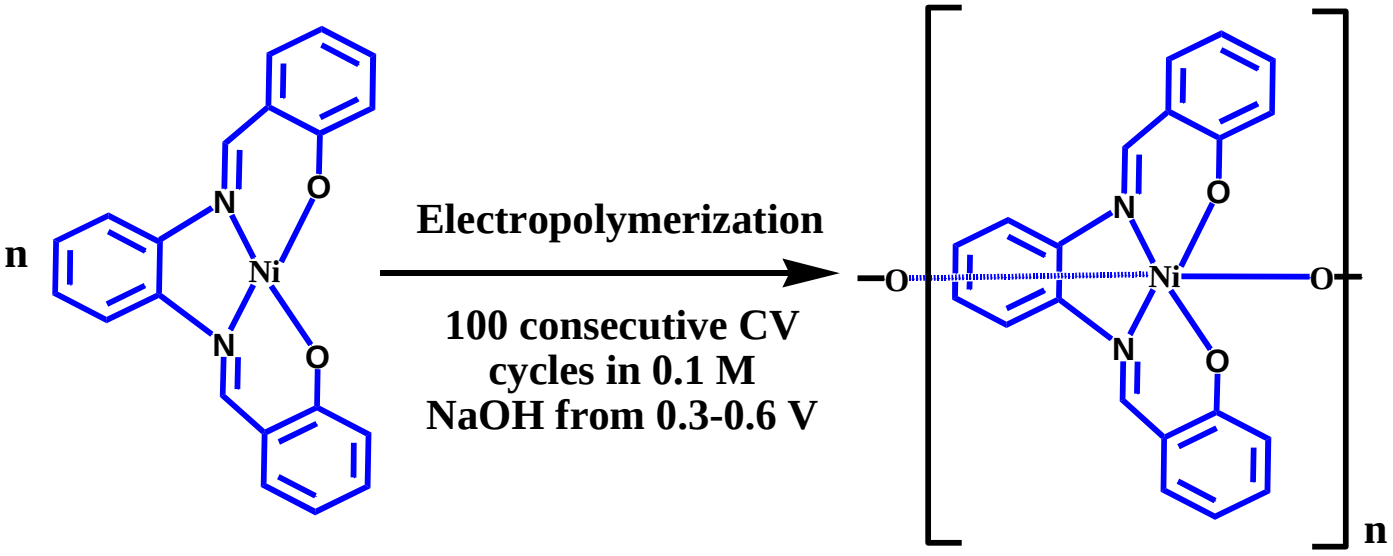

Fig. S1 IR spectra of salophen (a), Ni^{II}-S (b), MWCNT-Ni^{II}-S (c) and MWCNT (d).

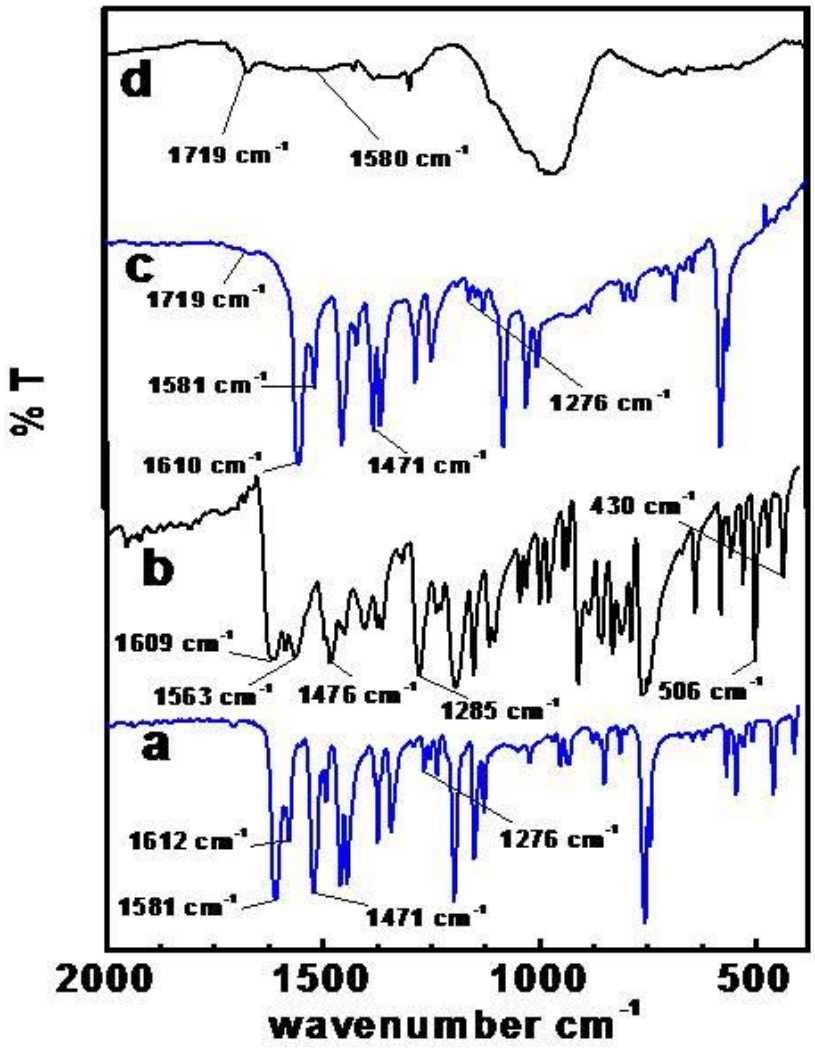

Fig. S2 SAED patterns of MWCNT (a) and MWCNT-Ni^{II}-S (b).

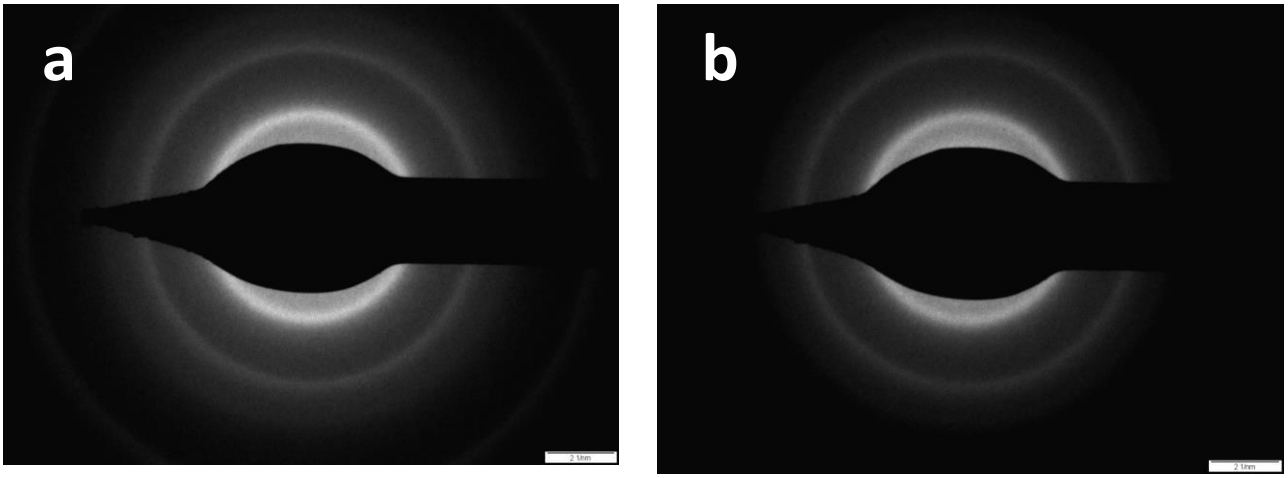

Fig. S3 The calibration plot (oxidation peak current *vs* [Glucose]) obtained from CV for the determination of glucose in the range of 1.0-50000 µM. The straight line indicates the linear calibration range from 1.0-15000 µM.

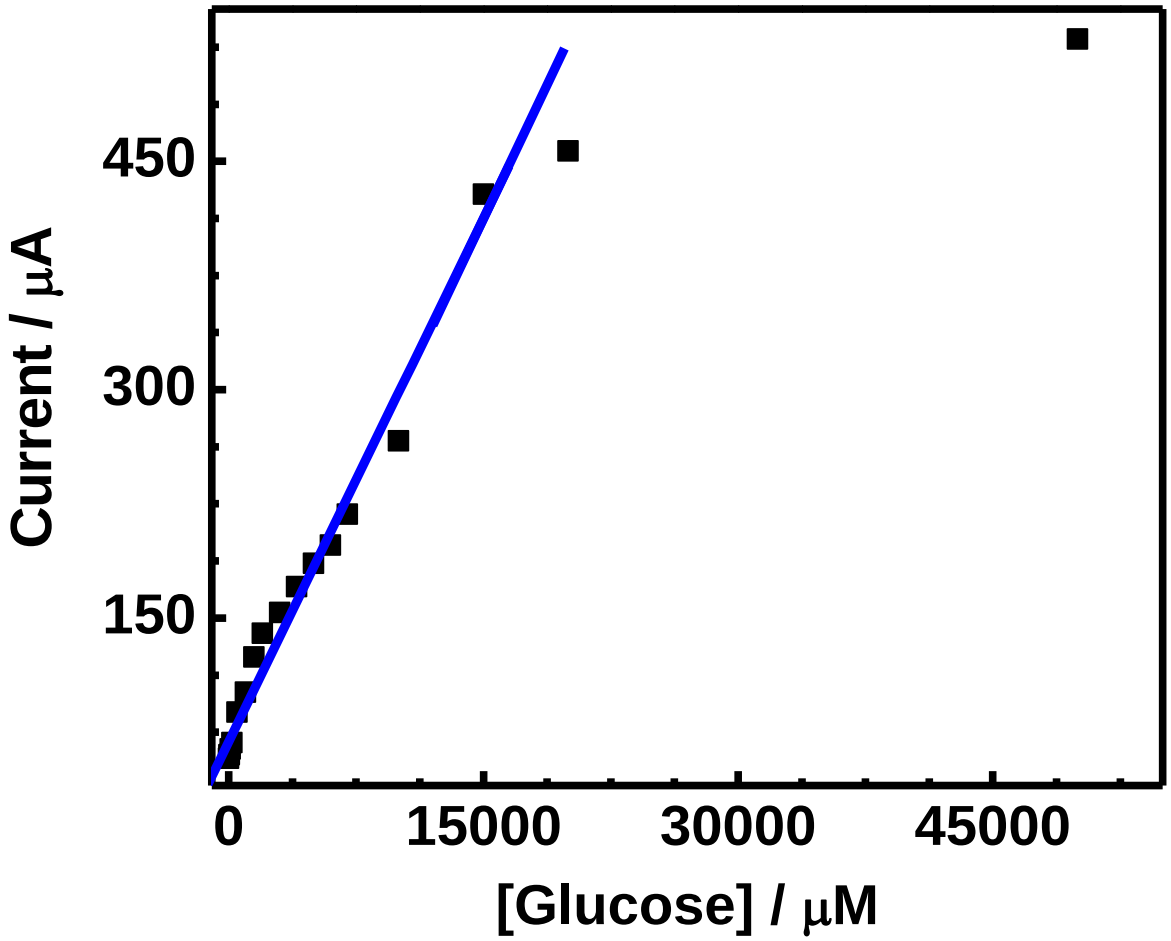

Fig. S4 Chronoamperometry response of GC/MWCNT-Ni^{II}-S with different concentrations of glucose from 0.1 to 1.0 mM in 0.1 M NaOH. Inset (i) represents the I_p *vs.* $t^{-1/2}$ plot at 0.4 mM glucose and inset (ii) represents the plot between I_{cat}/I_L and $t^{1/2}$.

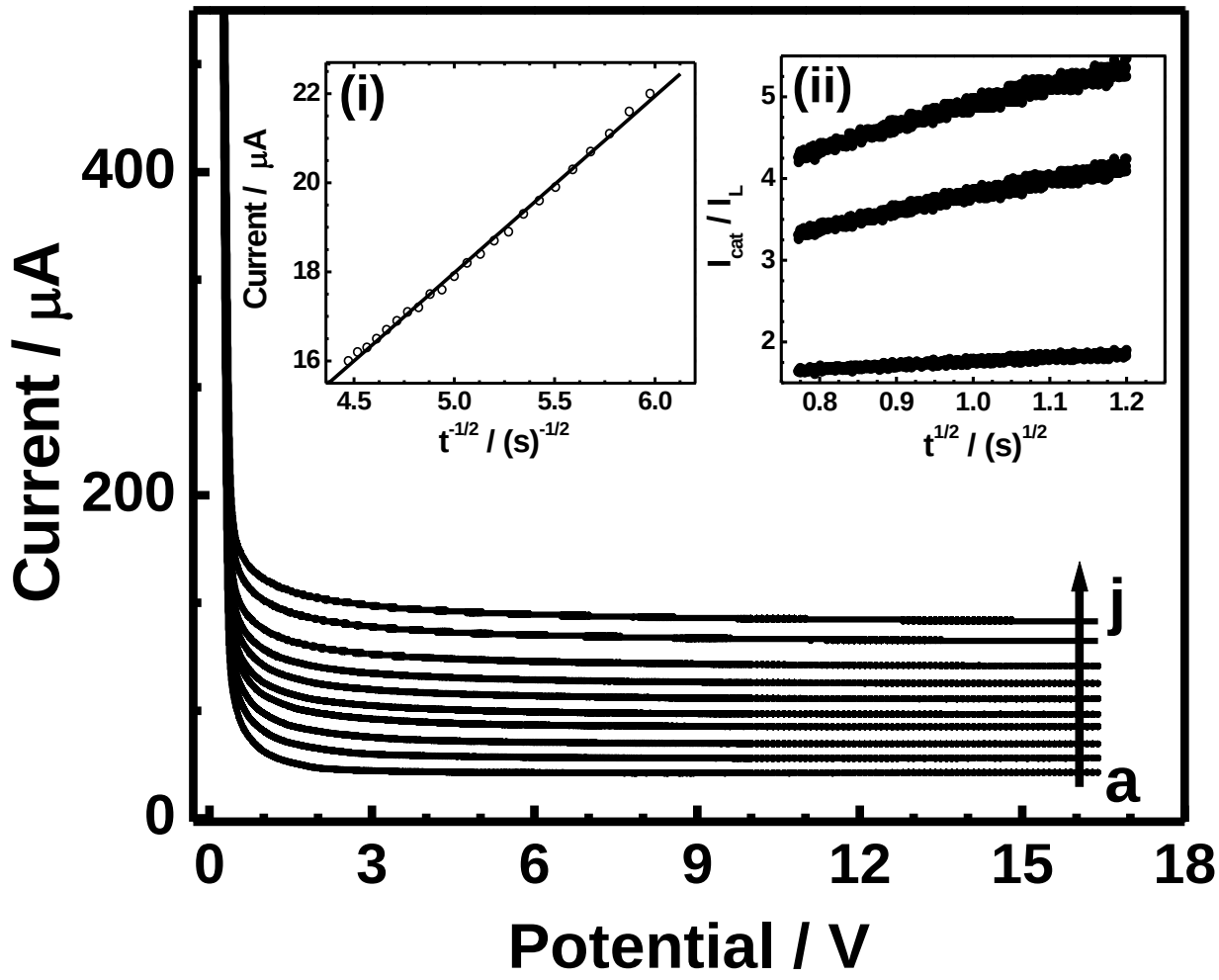

Fig. S5 Cyclic voltammetry responses at GC/MWCNT-Ni^{II}-S for 1.0 mM glucose alone (a) and 1.0 mM paracetamol with 1.0 mM glucose (b) in 0.1 M NaOH. Scan rate 20 mVs^{-1}.