Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supplementary Information

Restacked crystallites of β-NiS and Ppy based nanocomposite for determination of theophylline and uric acid on screen printed electrode

P.Muthukumaran[a] R. Ramya[a] P. Thivya[a] J.Wilson[a]* and G.Ravi[b]

[a]Polymer Electronics Lab, Department of Bioelectronics and Biosensors, Alagappa University Karaikudi-630004, Tamilnadu, India.

[b]Photonic Crystals Lab, Department of Physics, Alagappa University, Karaikudi-630004, Tamilnadu, India.

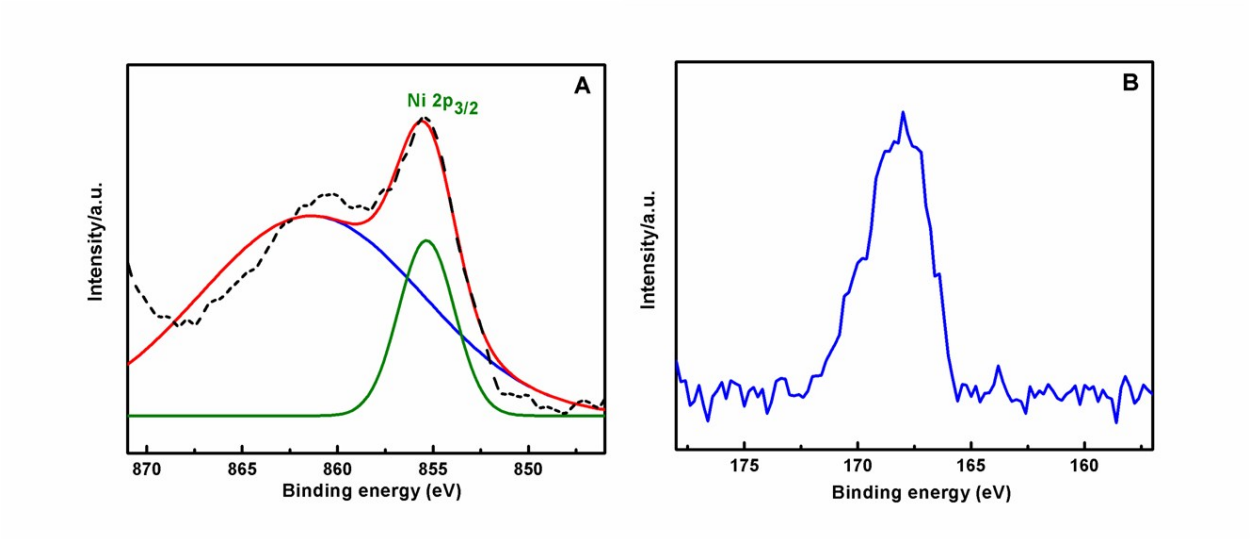

Fig. S1 (A) Ni $2p_{3/2}$ and (B) S2p of calcinated β-NiS sample.

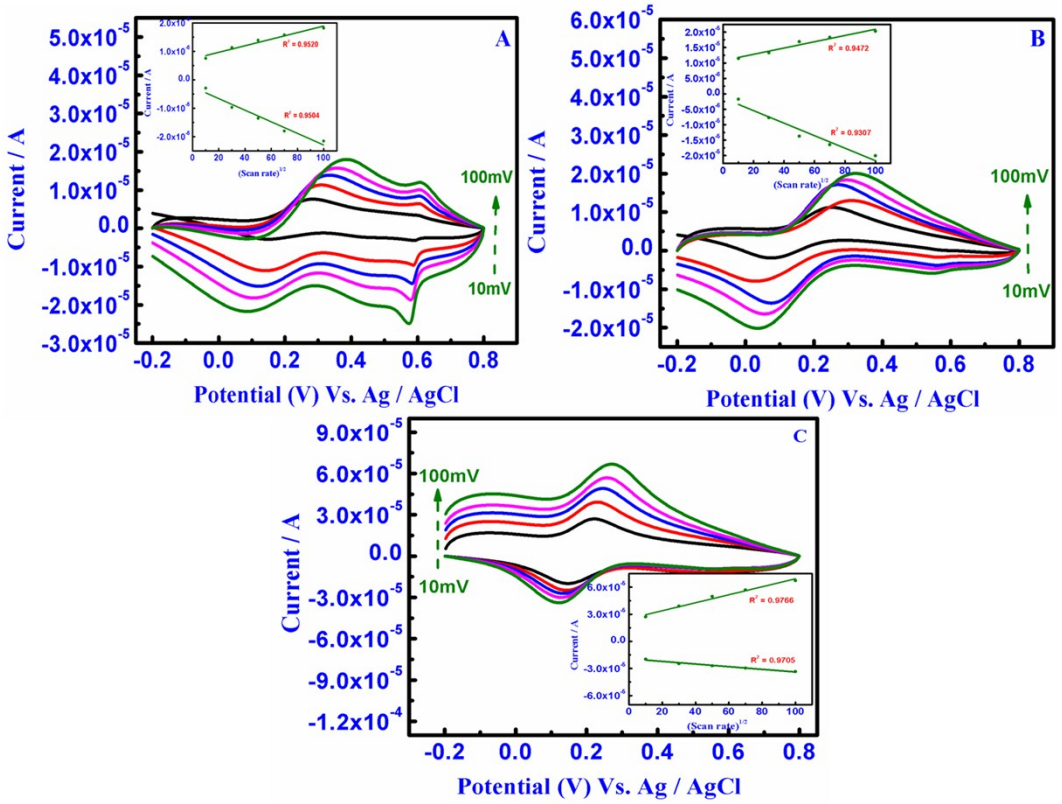

Fig. S2. CV behavior (A) β-NiS (B) Ppy (C) β-NiS/Ppy/SPE nanocomposite for different scan rate (10-100 mVs^{-1}) by preparing stock solution in presence of 1mM each $[Fe(CN)_6]^{3-}$ (Ferricyanide) and $[Fe(CN)_6]^{4-}$ (Ferrocyanide) with 0.1 M of KCl in 100 ml of deionized water.

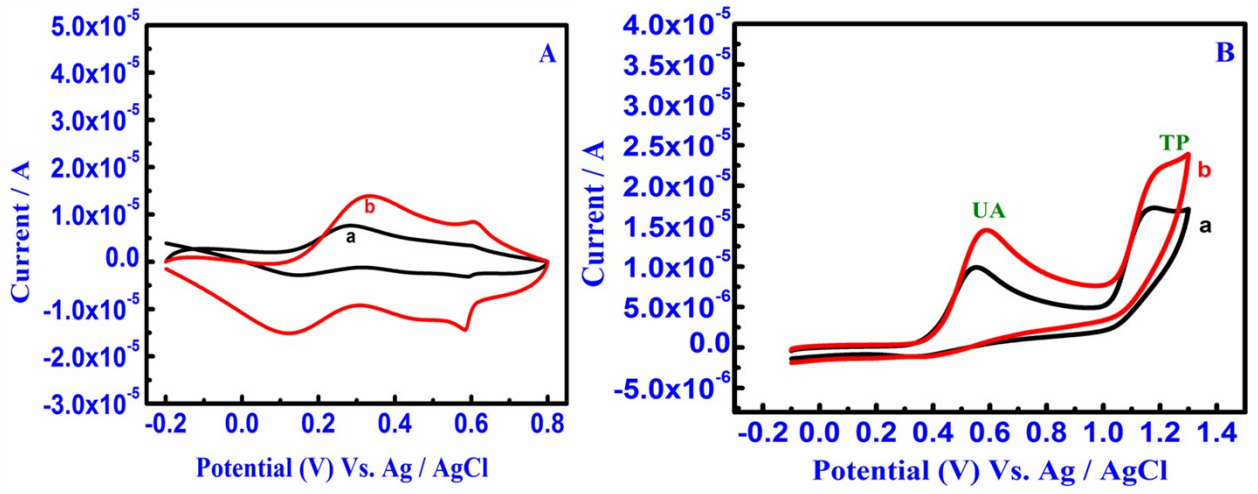

Fig. S3 (A) CV curve (a) uncalcinated β-NiS, (b) calcinated β-NiS in 50 mVs^{-1} by preparing stock solution in presence of 1mM each $[Fe(CN)_6]^{3-}$ (Ferricyanide) and $[Fe(CN)_6]^{4-}$ (Ferrocyanide) with 0.1 M of KCl in 100 ml of deionized water.**(B) CV curve (a) uncalcinated β-NiS, (b) calcinated β-NiS in presence of 500 µM TP and UA at pH 6.0 PBS**

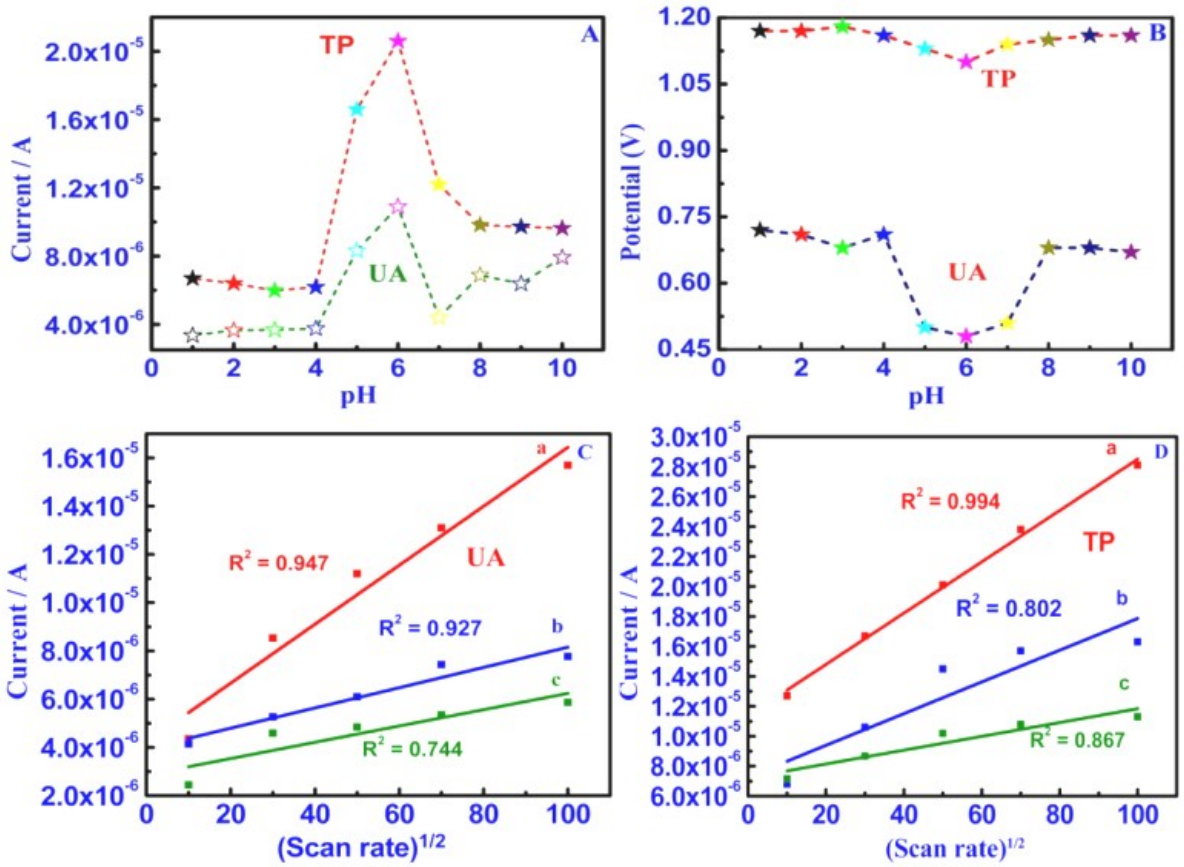

Fig. S4 Plot of from pH (1-10) for pH vs current, (B) pH vs. potential for β-NiS/Ppy/SPE modified electrode TP and UA in 500 µM. (C) and (D) i_{pa} vs (scan rate)$^{1/2}$ (a) β-NiS/Ppy (b) Ppy (c) calcinated β- NiS modified electrode in 500 µM UA and TP at pH 6.0.

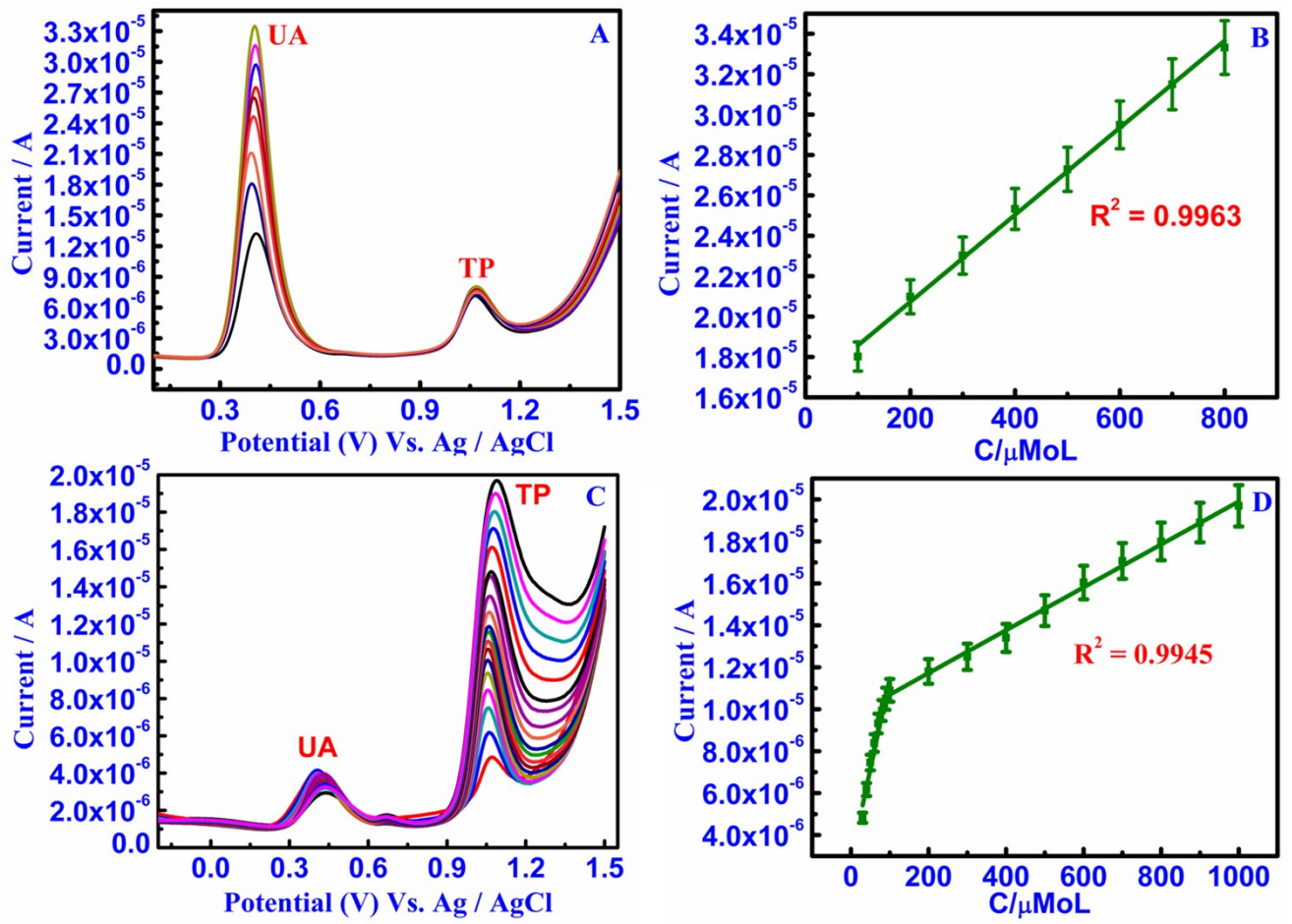

Fig. S5 SWV(A) and (C) Selectivity test for UA and TP on β-NiS/Ppy/SPE by varying the concentration in 0.1M PBS at (pH 6.0) and (B) and (D) Calibration plot of the oxidation peak current against different concentrations of TP and UA.

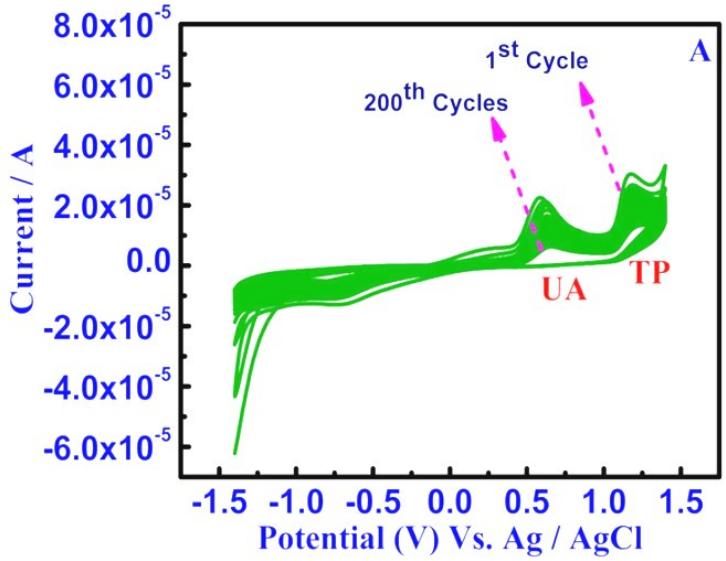

Fig. S6 Stability studies (A) simultaneous bahavior of UA and TP on β-NiS/Ppy/SPE for consecutive 200 cycles at scan rate 50mVs^{-1} presence of 500µM analyte in 0.1M PBS at (pH 6.0).

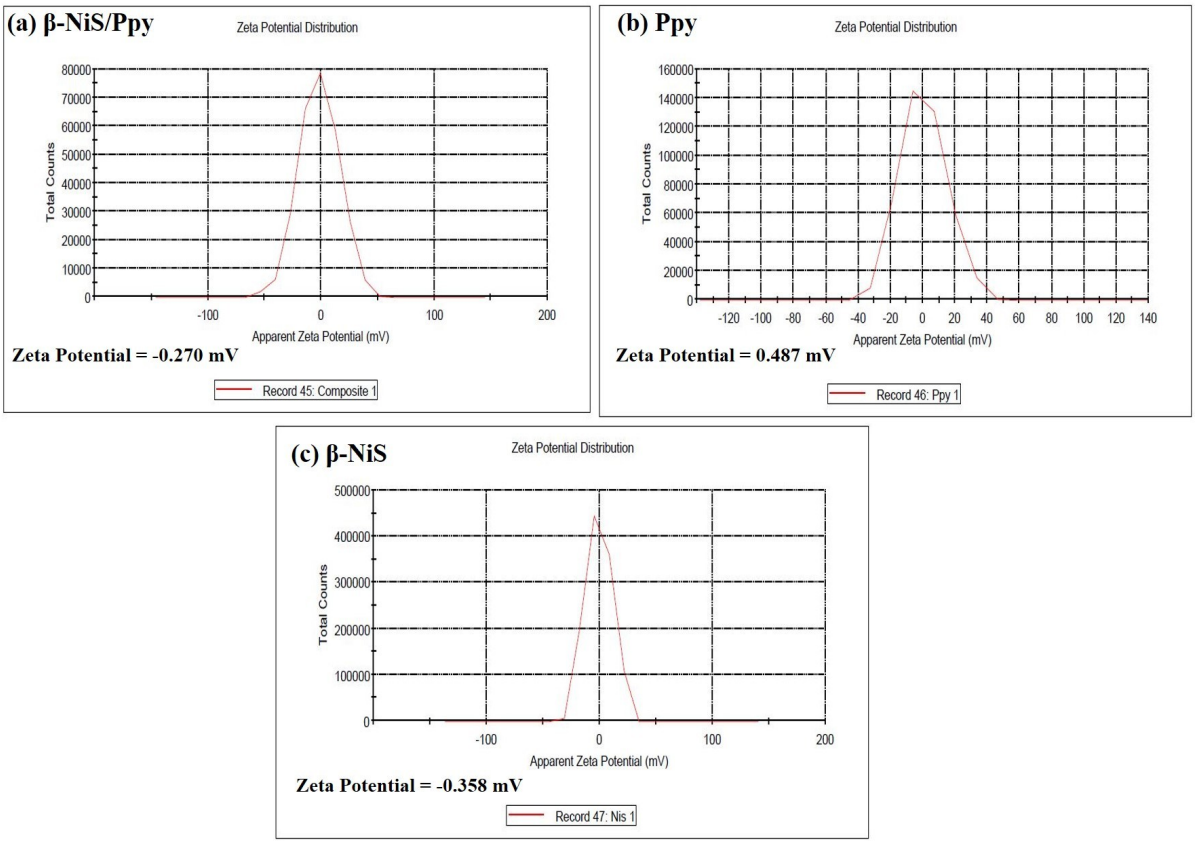

Fig. S7 Zeta potential analysis of (a) β-NiS/Ppy, (b) Ppy and (c) β-NiS samples,

Table S1: Comparison table performances for TP with other reported literature

S.No.	Materials	Linear range	Limit of detection	Ref
1.	Graphene nanosheet/GCE	$5.0 \times 10^{-8} – 4.0 \times 10^{-5}M$	2.9×10^{-9}	[1]
2.	Urchin-like CdSe microparticle/GCE	$1.0 \times 10^{-6} – 7.0 \times 10^{-4}M$	4.0×10^{-7}	[2]
3.	Carbon paste electrode/ CTAB	$8.0 \times 10^{-7} – 2.0 \times 10^{-4}M$	1.8×10^{-7}	[3]
4.	Xanthine oxidase electrode	$2.0 \times 10^{-7} – 5.0 \times 10^{-5}M$	2.0×10^{-7}	[4]
5.	MWCNT/GCE	$3.0 \times 10^{-7} – 1.0 \times 10^{-5}M$	5.0×10^{-8}	[5]
6.	Nafion:lead–ruthenium oxide pyrochlore chemically modified electrode	$2.0 \times 10^{-5} – 1.0 \times 10^{-4}M$	1.0×10^{-7}	[6]
7.	AT-AuNPs/GCE	4.0×10^{-8} - 1.0×10^{-4} M	8.0×10^{-9}	[7]

Table S2 Summarized table for TP and UA determination simultaneously compared with literature

Modified active electrode	Linear range (TP and UA)	Limit of detection	Ref
CdS/PTA/Nafion/GCE	TP (1×10^{-6} - 2×10^{-4}) M UA (5×10^{-6} - 1×10^{-3})M	TP (6×10^{-7})M UA (2×10^{-6}) M	[44]
β-NiS/Ppy/SPE	UA(10×10^{-9} - 900×10^{-6})M TP(20×10^{-9} - 1×10^{-3})M	UA (1×10^{-9}) TP (5×10^{-9})M	This work

Table S3 Voltammetric signal for UA,TP recovery tests performed in fresh human urine, serum and fresh tea leaves with β-NiS/Ppy, pH=6.0

Samples	*Added [UA, TP] µM*	*Obtained [UA, TP] µM*	*Recovery (%) [UA, TP]*
Tea leaves	***— , 4.00***	***— , 4.10***	***— , 102.5***
Human urine	***7.25 , 50.00***	***7.50 , 50.31***	***97.06 , 99.38***
Blood serum	***6.06, 1.00***	***6.00 , 1.05***	***101.0, 105.3***

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