

# Supplementary Information

## Detection and Degradation Studies of Nile Blue Sulphate Using Electrochemical and UV-Vis Spectroscopic Techniques

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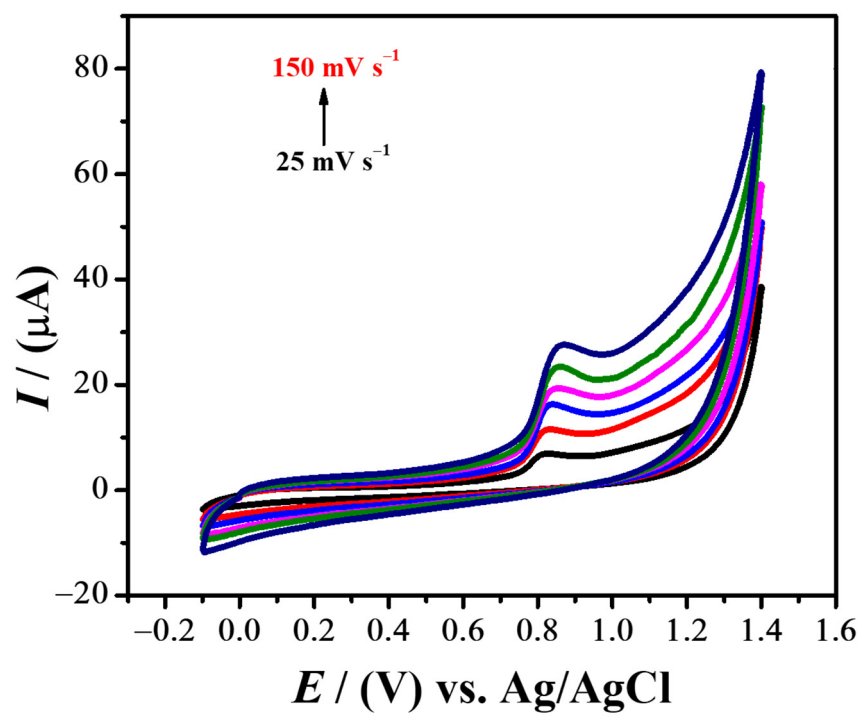
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**Table S1.** Parameters evaluated from EIS experiments conducted on various electrodes.

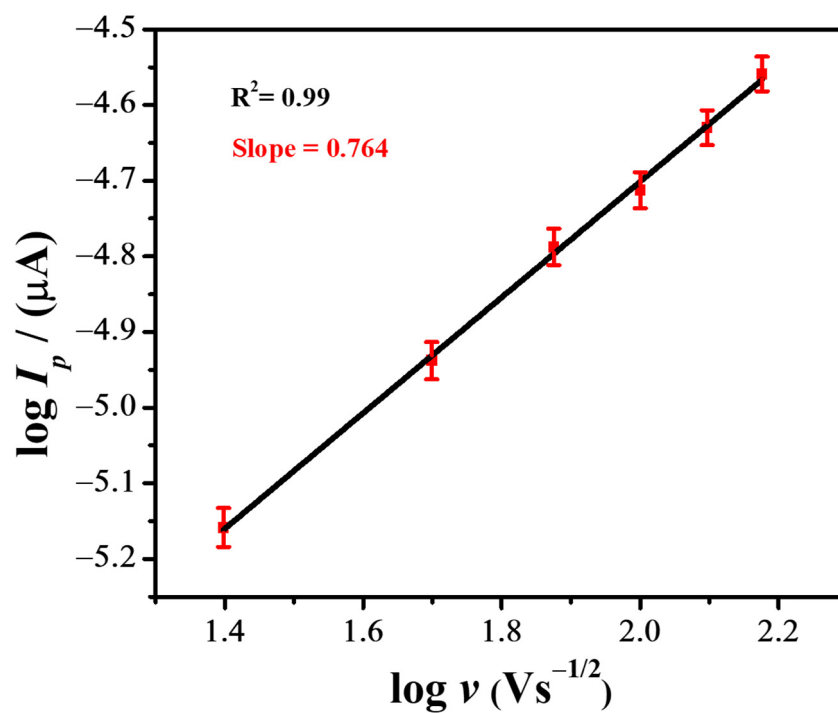
Electrode	$R_s$ ( $\Omega$ )	$R_{ct}$ ( $\Omega$ )	CPE ( $\mu F$ )	n	$k$ ( $cm\ s^{-1}$ )
Bare GCE	117	9279	111	0.84	$3.02 \times 10^{-4}$
MWCNTs/GCE	110	4277	94.8	0.81	$3.11 \times 10^{-4}$
COOH-f/MWCNTs/GCE	112	2118	1.81	0.73	$3.26 \times 10^{-4}$

**Table S2.** Electroactive surface areas of bare and modified electrodes.

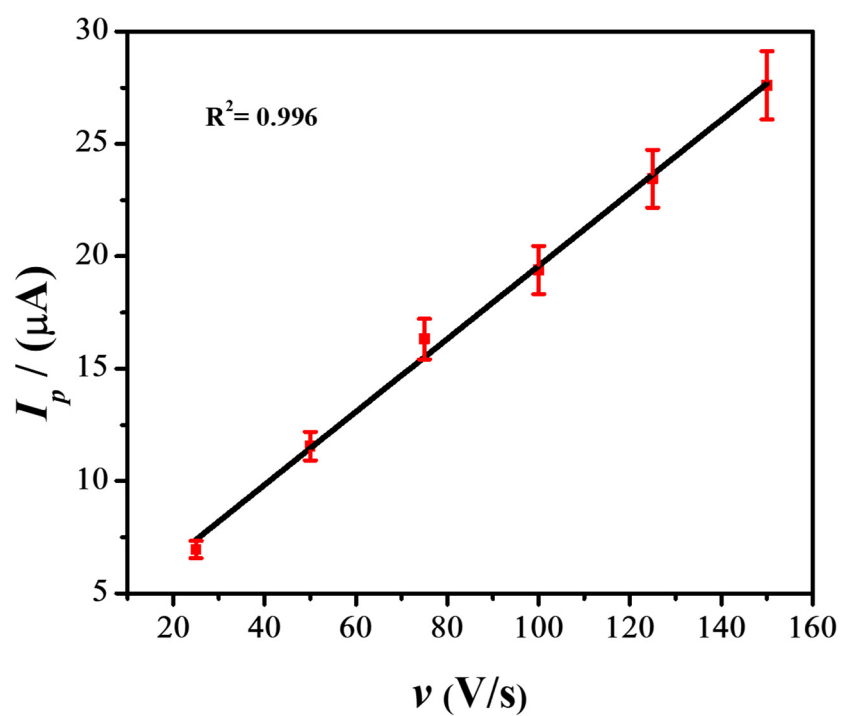
Working electrode	Electroactive surface area ( $cm^2$ )
Bare GCE	0.02
MWCNTs/GCE	0.04
COOH-f/MWCNTs/GCE	0.08



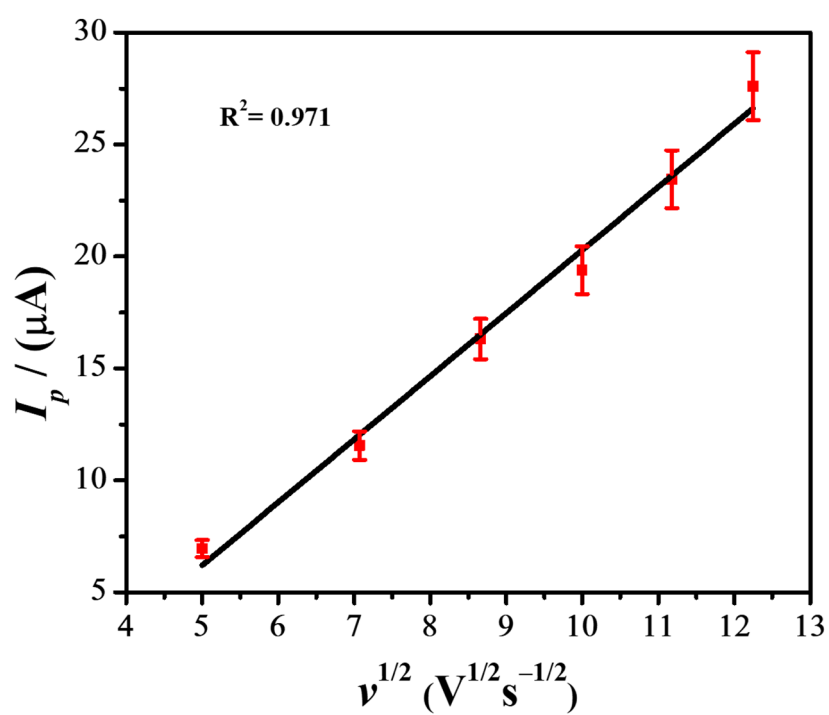
**Figure S1.** Influence of scan rate on the anodic peak current of the NBS in supporting electrolyte of PBS of pH 6.0.



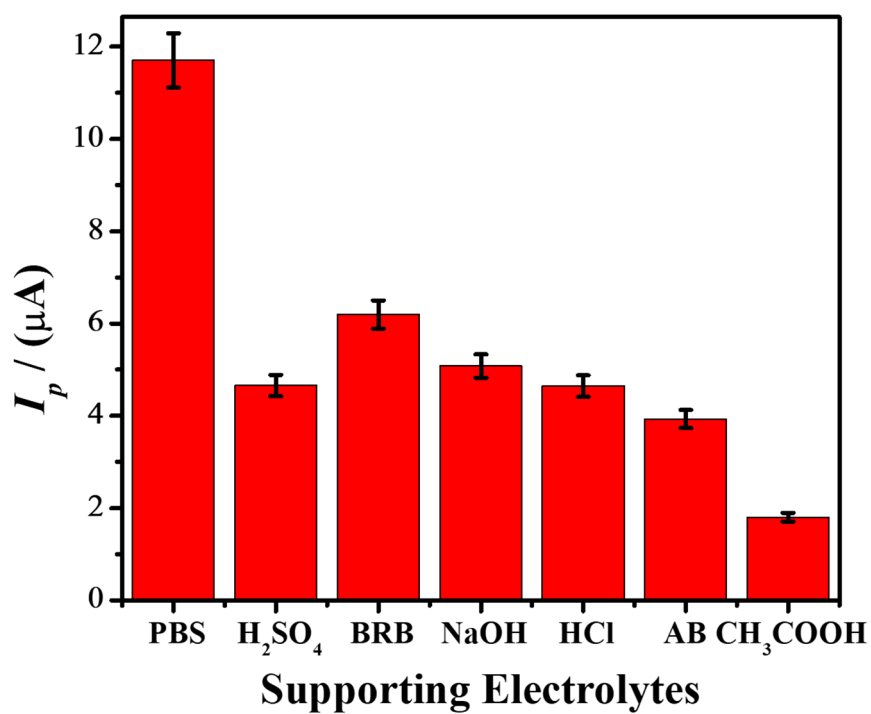
**Figure S2.** Calibration plot between the log peak current vs. log scan rate of NBS oxidation.



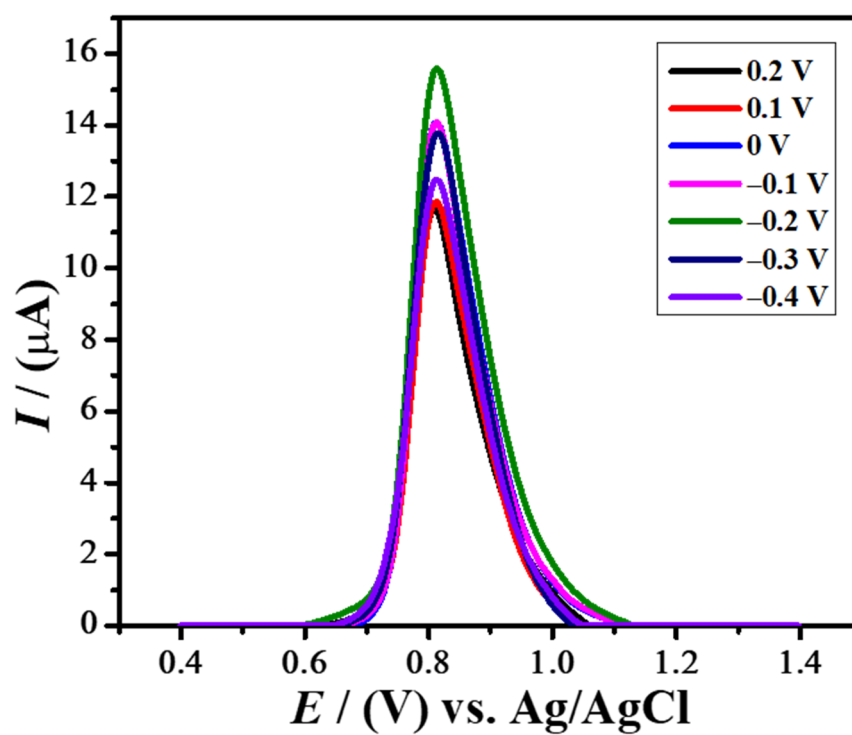
**Figure S3.** A plot of  $I_p$  vs.  $\nu$  of NBS oxidation.



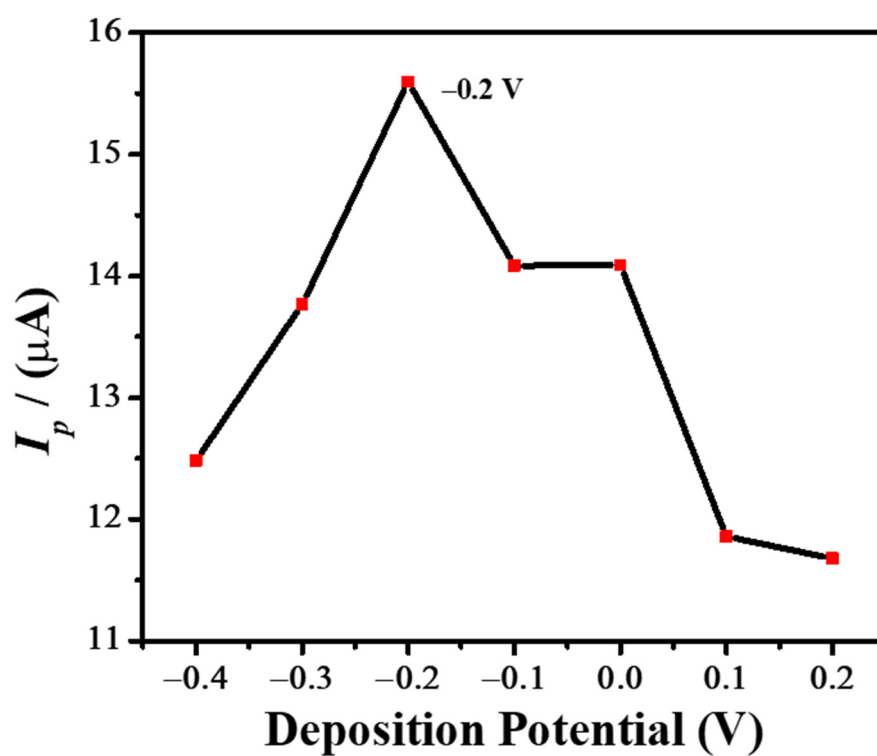
**Figure S4.** A plot of  $I_p$  vs.  $\nu^{1/2}$  of NBS oxidation.



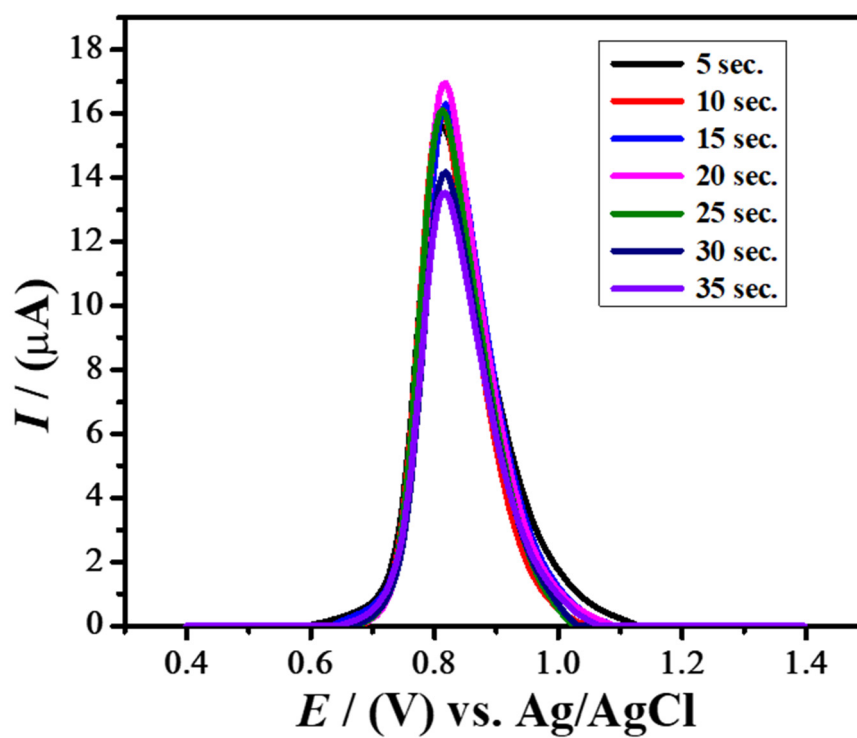
**Figure S5.** Bar graph of the oxidation peak current of NBS vs. various supporting electrolytes.



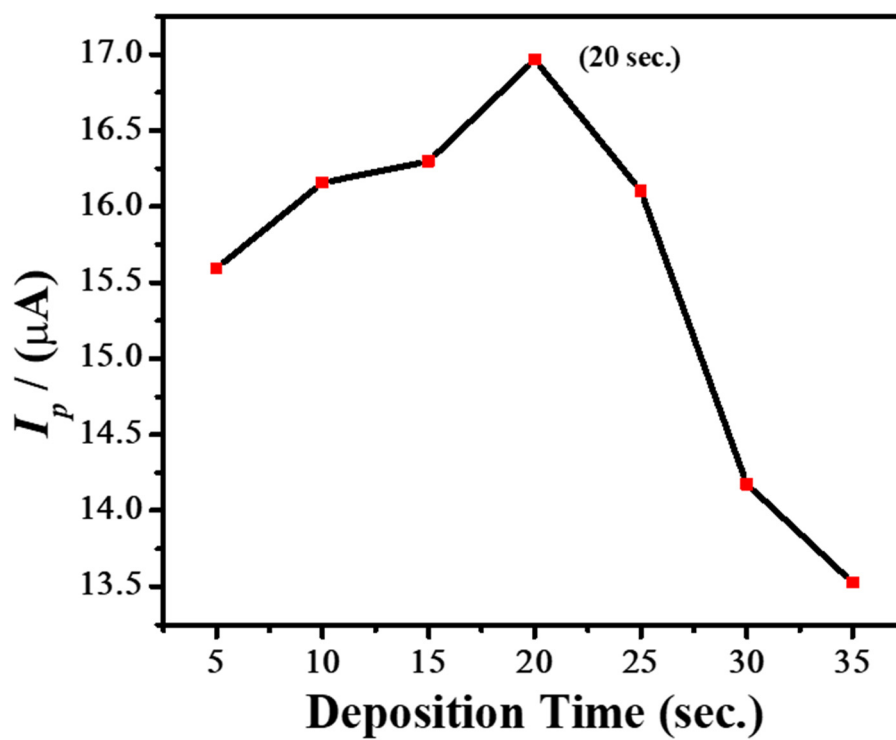
**Figure S6.** Effect of accumulation potential on the peak current of 10  $\mu\text{M}$  NBS in PBS of pH 6.0 using COOH-/MWCNTs/GCE.



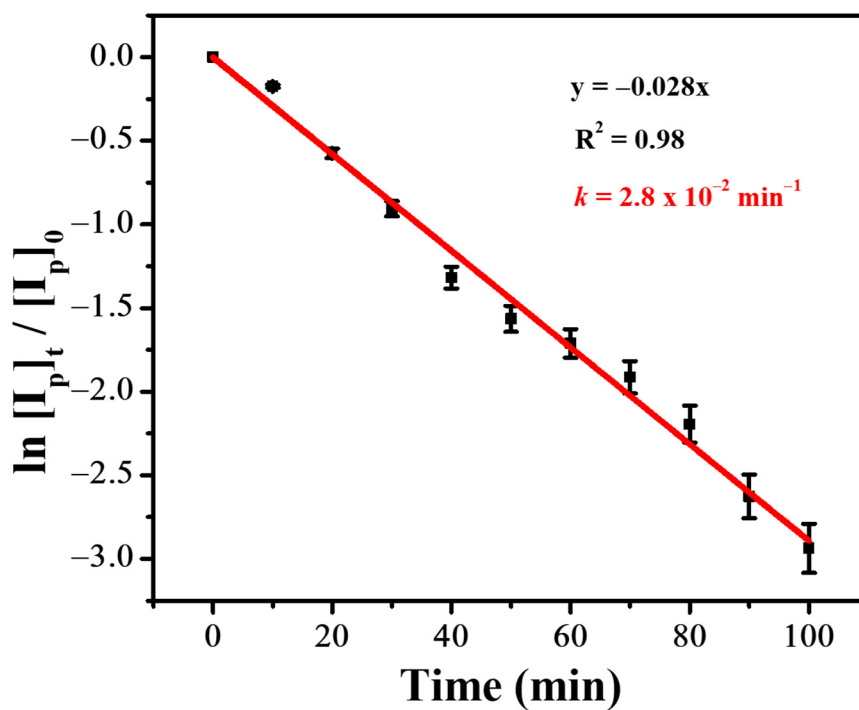
**Figure S7.** A plot of  $I_p$  vs. deposition potential.



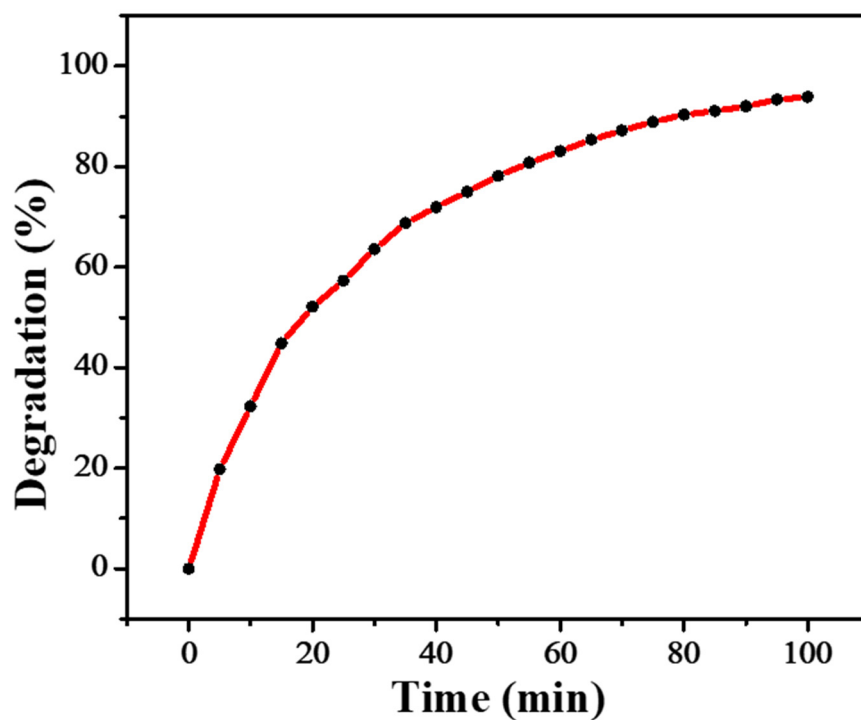
**Figure S8.** Peak current response of 10  $\mu\text{M}$  NBS at different deposition times.



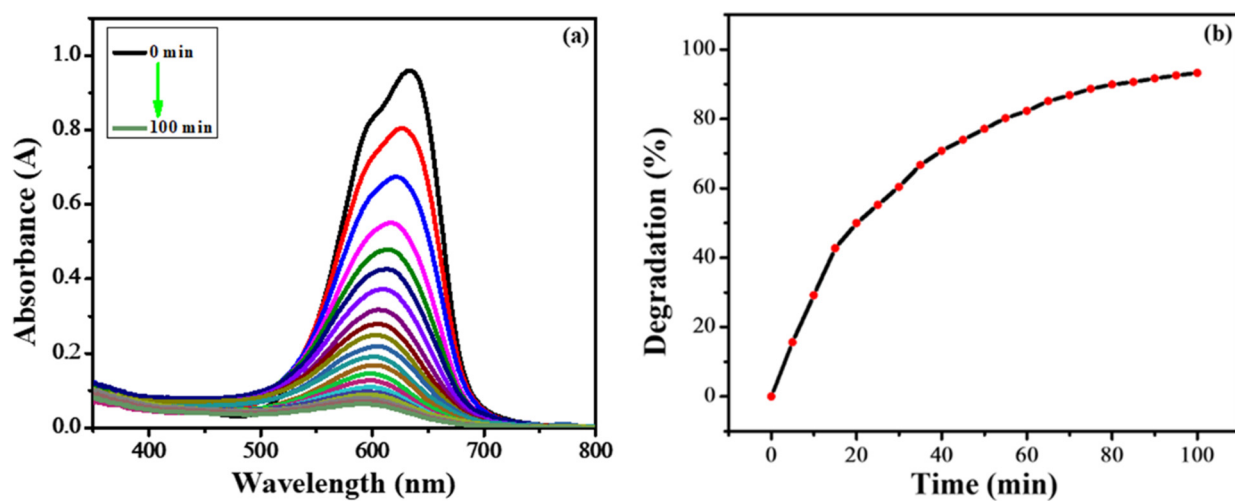
**Figure S9.** Plot between peak current vs. deposition time of NBS oxidation.



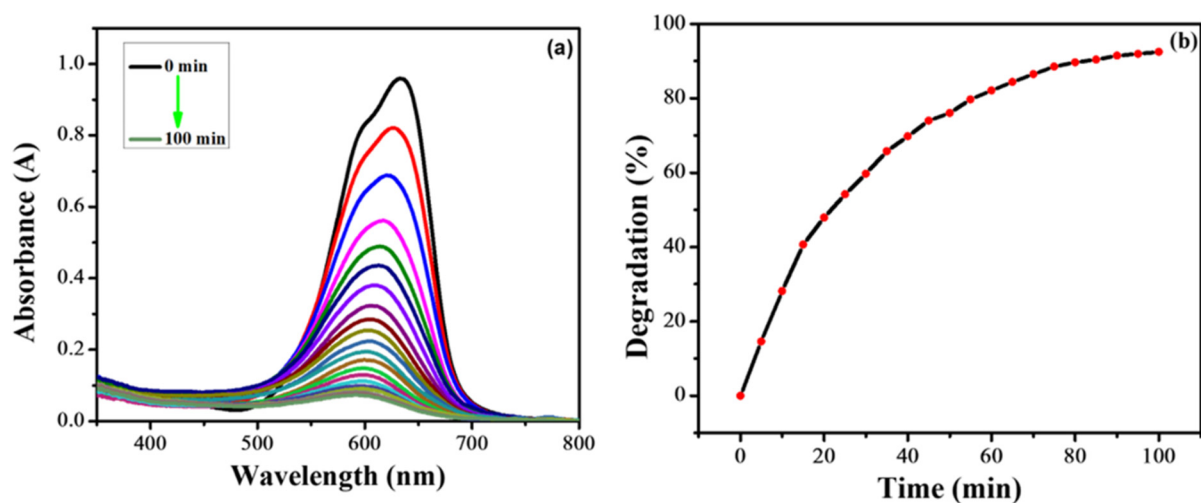
**Figure S10.** Kinetic study of NBS photocatalytic degradation using SWV data.



**Figure S11.** Percentage degradation of NBS using UV-visible Spectroscopic data.



**Figure S12:** (a) UV-Vis spectra of the photodegradation of NBS at different time intervals after recovery of photocatalyst for the first time. (b) %age degradation of NBS at different time intervals after recovery of photocatalyst for the first time.



**Figure S13:** (a) UV-Vis spectra of the photodegradation of NBS at different time intervals after recovery of photocatalyst for the second time. (b) %age degradation of NBS at different time intervals after recovery of photocatalyst for the second time