

## **SUPPORTING INFORMATION (SI)**

### **Nickel oxide thin film from electrodeposited Nickel sulfide thin film: Peroxide sensing and photo-decomposition of phenol**

#### **Figure captions:**

S1. (a) UV- Vis spectrum of NiS, inset Tauc plot.

S2. EDAX data of NiS thin film

Table1. Performances of different H<sub>2</sub>O<sub>2</sub> sensors.

### **Optical studies**

The absorption spectrum (Figure S1) of NiS shows a sharp change around 460 nm. Optical band gaps were calculated from the absorbance data by plotting  $(\alpha h\nu)^2$  versus  $h\nu$  and extrapolating the linear portion of the curve to the x-axis;  $\alpha$  being the absorption coefficient and  $h\nu$  the photon energy. The direct band gap ( $E_g$ ) measured from the absorption value was found to be 2.69 eV, which is blue shifted to 0.59 eV over bulk NiS (2.10 eV).

### **EDAX analysis**

The elemental analysis was carried out by the EDX probe associated with FESEM and the Ni:S ratio was found close to unit (Figure S2)

## Figures

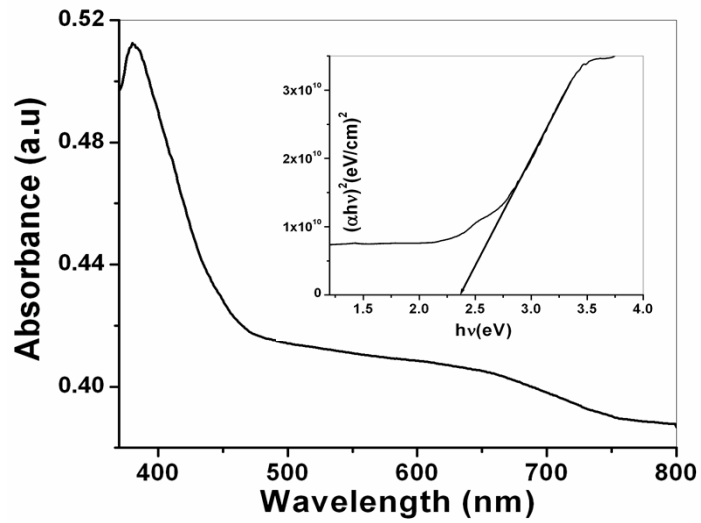


Figure S1 (a) UV- Vis spectrum of NiS, inset Tauc plot.

Spectrum processing :

Peaks possibly omitted : 1.485, 3.325 keV

Processing option : All elements analyzed (Normalised)

Number of iterations = 2

Standard :

S FeS2 1-Jun-1999 12:00 AM

Ni Ni 1-Jun-1999 12:00 AM

Element	Weight%	Atomic%
S K	36.65	49.95
Ni K	63.35	51.05
Totals	100.00	

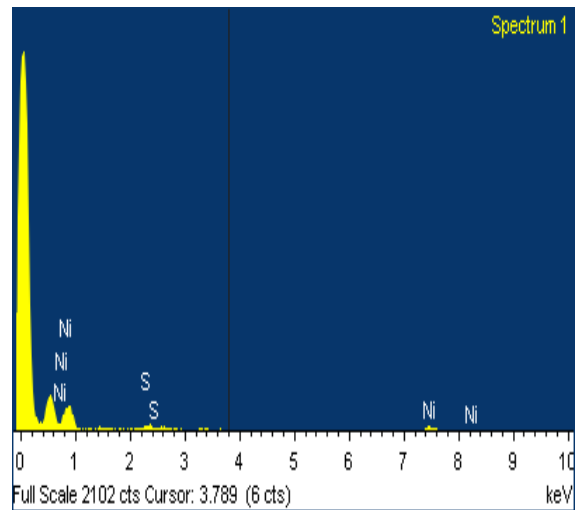


Figure S2: EDAX data of NiS thin film

Electrode	Applied potential (V)	Detection limit	Sensitivity	Linear range	Reference
HRP	-	1.6 $\mu\text{M}$	12.8 $\mu\text{A mM}^{-1}$	4 $\mu\text{M}$ to 100 $\mu\text{M}$	35
Cytochrome c/Au/C	- 0.1 (vs. Ag/AgCl)	-	-	10 $\mu\text{M}$ to 1.0 mM	36
AgNPs/ZnONRs/FTO	- 0.55 (vs. Ag/AgCl)	0.9 $\mu\text{M}$	152.1 $\mu\text{A mM}^{-1}$	8 $\mu\text{M}$ to 983 $\mu\text{M}$	37
ZnO/Au/Nafion/HRP/GCE	- 0.3 (vs. Ag/AgCl)	9.0 $\mu\text{M}$	-	15 $\mu\text{M}$ to 1.1 mM	38
MnO <sub>2</sub> /Nafion/GCE	+ 0.8 (vs. Ag/AgCl)	2 $\mu\text{M}$	-	10 $\mu\text{M}$ to 1.5 mM	39
Cu <sub>2</sub> S/OMCs/Nafion/GCE	- 0.1 (vs. Ag/AgCl)	0.2 $\mu\text{M}$	36.8 $\mu\text{A mM}^{-1}$	1 $\mu\text{M}$ to 3.03 mM	40
Co <sub>3</sub> O <sub>4</sub> /GCE	- 0.2 (vs. Ag/AgCl)	10 $\mu\text{M}$	4.84 $\mu\text{A mM}^{-1}$	0 $\mu\text{M}$ to 5.35 mM	41
FeS/GCE	- 0.4 (vs. Ag/AgCl)	0.092 $\mu\text{M}$	-	0.5 $\mu\text{M}$ to 150 $\mu\text{M}$	42
NCNT/GCE	+ 0.3 (vs. SCE)	0.37 $\mu\text{M}$	24.5 $\mu\text{A mM}^{-1}$	1.76 $\mu\text{M}$ to 139 $\mu\text{M}$	43
SWCNT ensemble networks	-	1.0 mM	-	1.9 to 24 mM	44
CPE/PNMA(SDS)/Co	-	0.018 mM	-	0.03 mM to 12 mM	45
NiO/ITO electrode	+ 0.5 (vs. Ag/AgCl)	1.28 mM	2.3 mA $\text{mM}^{-1}$	10 to 1000 $\mu\text{M}$	Present work

**Table1.** Performances of different H<sub>2</sub>O<sub>2</sub> sensors.