Electronic Supplementary Material (ESI) for Analyst

Supporting Information (SI)

Fabrication of Cr doped SnO_2 nanoparticles based biosensor for the selective determination of riboflavin in pharmaceuticals

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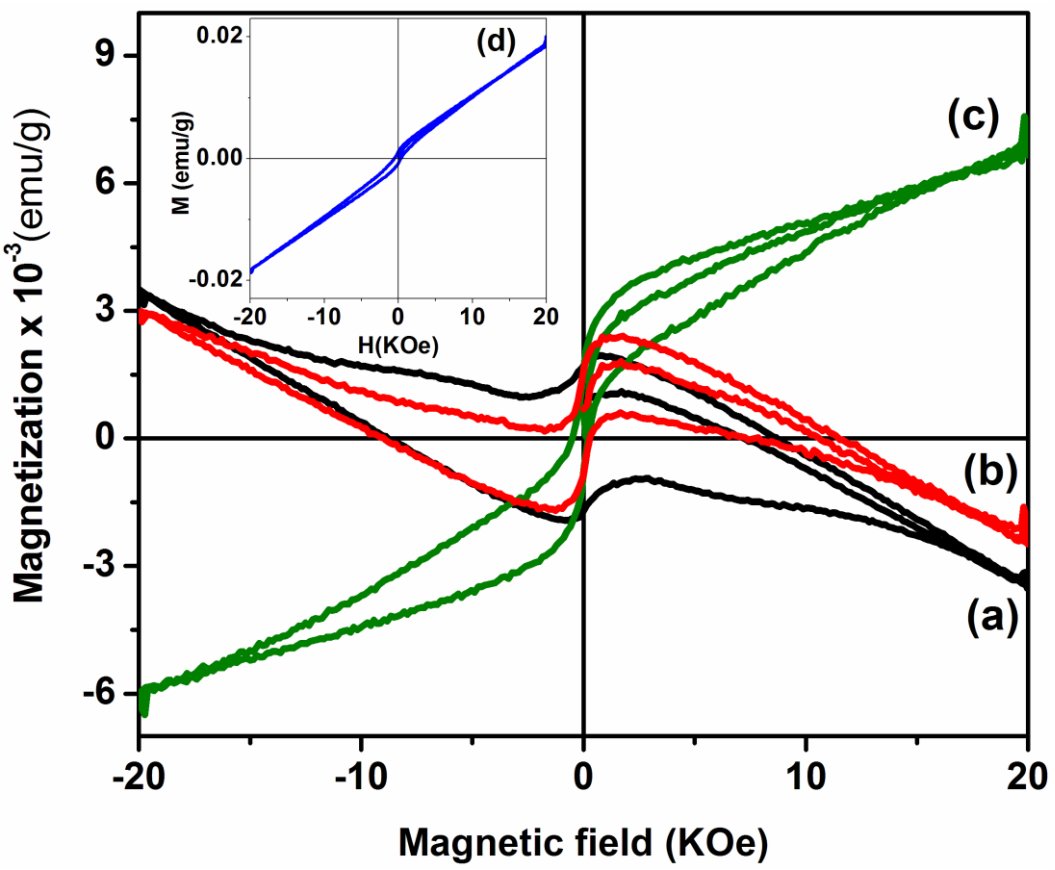

Fig. S1 M-H curves of (a) undoped SnO_2, (b) 1 wt%, and (c) 3 wt% Cr doped SnO_2 nanoparticles. An inset shows the weak ferromagnetic behaviour of 5 wt% Cr-SnO_2**.**

Table S1 Variation of grain size, lattice parameters (*a* and *c*) of the unit cell and cell volume with Cr concentration.

Dopant Concentration (wt %)	Crystallite size (nm)	Lattice Parameter a (Å)	Lattice Parameter c (Å)	Cell volume ($Å^3$)
0	19	4.739	3.185	71.529
1	15	4.732	3.181	71.228
3	13	4.725	3.178	70.950
5	11	4.718	3.169	70.539

Table S2 Effect of interference on RF determination for the nano-Cr-SnO_2 modified electrode

Interfering species	Interferents concentration (μM)	Concentration ratio (Riboflavin: Interferents)	Recovery (%)
L–ascorbic acid	10	1:10	114
Uric acid	10	1:10	109
Serotonin	10	1:10	94
Epineprine	10	1:10	96
Cystamine	10	1:10	90
Dopamine	10	1:10	85
Tyrosine	10	1:10	102
Fe	100	1:100	91
Mg	100	1:100	111
Ca	100	1:100	96
RF	1	-	-

Table S3 Comparison of the responses of other riboflavin sensors

Electrode Materials	Detection limit	Linear range	Author
[a]P3MT/GCE	5.0× 10^{-8} mol L^{-1}	1.0× 10^{-7} - 2.0× 10^{-4} mol L^{-1}	Zhang et al. (2010)
[b]CILE	0.1 nM	0.8–110nM	Safavi et al. (2010)
[c]Ds-DNA/PCE	0.34 µg mL^{-1}	0.5–70 µg mL^{-1}	Ensafi et al. (2012)
[d]Aza /PCPE	0.2 ng cm^{-3}	0.5 ng cm^{-3} to 70µg cm^{-3}	Kotkar et al. (2007)
[e]AgSAEs	8.2×10^{-10} mol L^{-1} (m-AgSAE) and 1.3×10^{-9} mol L^{-1} (p-AgSAE)	-	Bandzuchova et al. (2012)
[f]DNA/CNT	0.2 ng L^{-1} (5.31 ×10^{-13} mol L^{-1})	-	Ly et al. (2012)
[g]WO_3-TiO_2 /ITO	1.87 × 10^{-7} M	3.23 × 10^{-7} to 4.0 × 10^{-5} M	Li et al. (2012)
[h]Cr-SnO_2/GCE	107 nM	0.2 ×10^{-6} to 1.0 × 10^{-4} M	This work

[a] Poly (3- methylthiophene) modified glassy carbon electrode
[b] Carbon ionic liquid electrode
[c] Pencil graphite electrode
[d] Plain carbon paste/aza crown ethers modified electrode
[e]Silver solid amalgam electrodes
[f] DNA/ carbon nanotube paste electrode
[g] WO_3 – TiO_2 composite modified indium tin oxide electrode
[h] Cr doped SnO_2 nanoparticles modified glassy carbon electrode

References for Table S3

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