Electronic Supplementary Information

Title: Nitrite ion sensing properties of $ZnTiO_3$-TiO_2 composite thin films deposited from zinc-titanium molecular complex

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Elemental Analysis of $[Zn_2Ti_4(\mu\text{-}O)_6(TFA)_8(THF)_6]\bullet THF$ (1)

DATE & TIME	7/1/2014 12:47:02 PM			P_ID	20140701
SAMPLE ID	B3			USER ID	Administrator
WEIGHT (mg)	1.913			MODE	CHN
				SIGNALS	
				ZR	9486
	CARBON	27.960%		NR	9709
	HYDROGEN	2.877%		CR	18474
	NITROGEN	0.0%		HR	20513
	BLANKS	-14	279	225	
	K FACTORS	16.413	37.908	5.872	

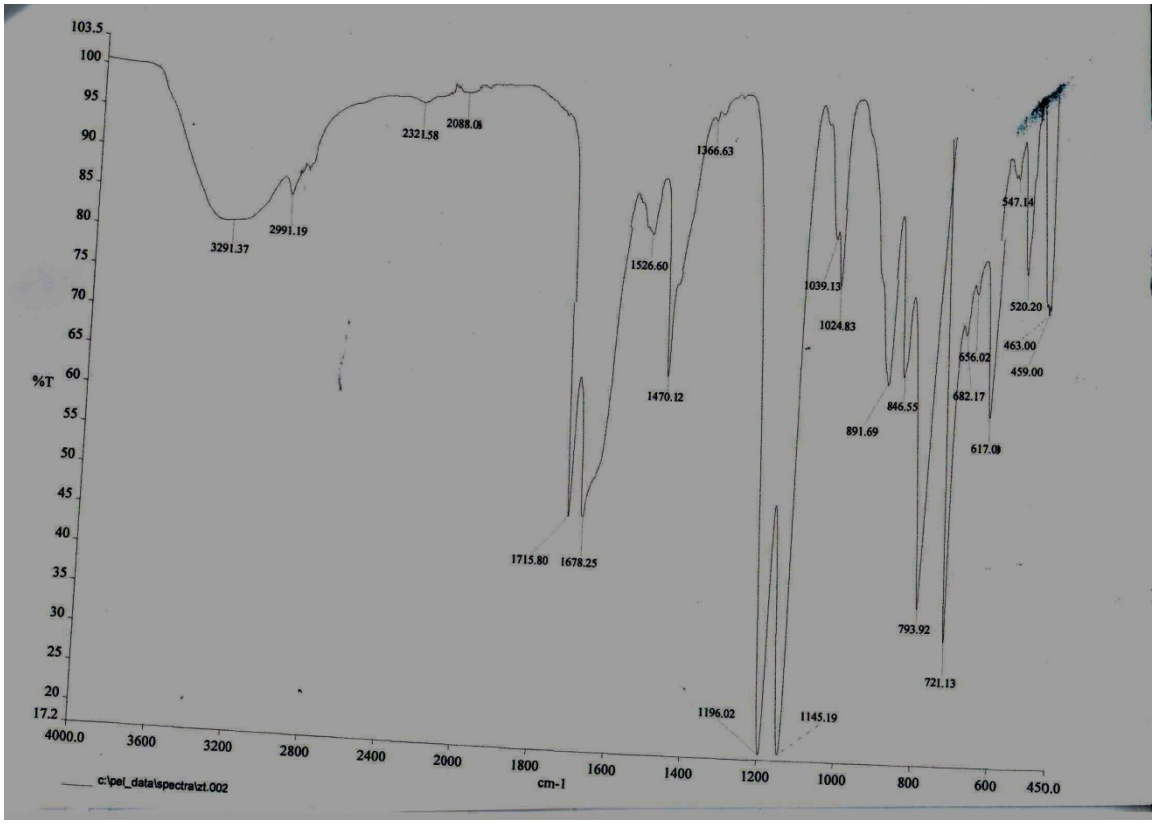

Fig. S1: FT-IR spectrum of precursor $[Zn_2Ti_4(\mu\text{-}O)_6(TFA)_8(THF)_6]\cdot THF$ (**1**).

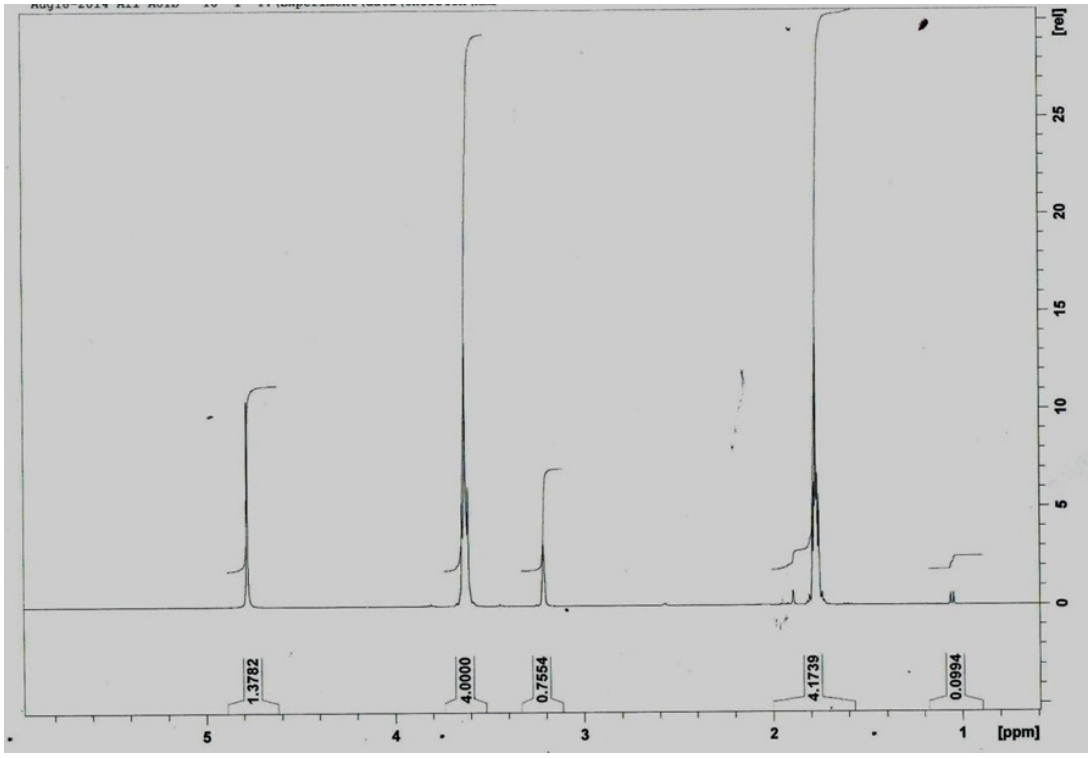

Fig. S2: ^{1}H-NMR spectrum of precursor $[Zn_2Ti_4(\mu\text{-}O)_6(TFA)_8(THF)_6]\cdot THF$ (**1**).

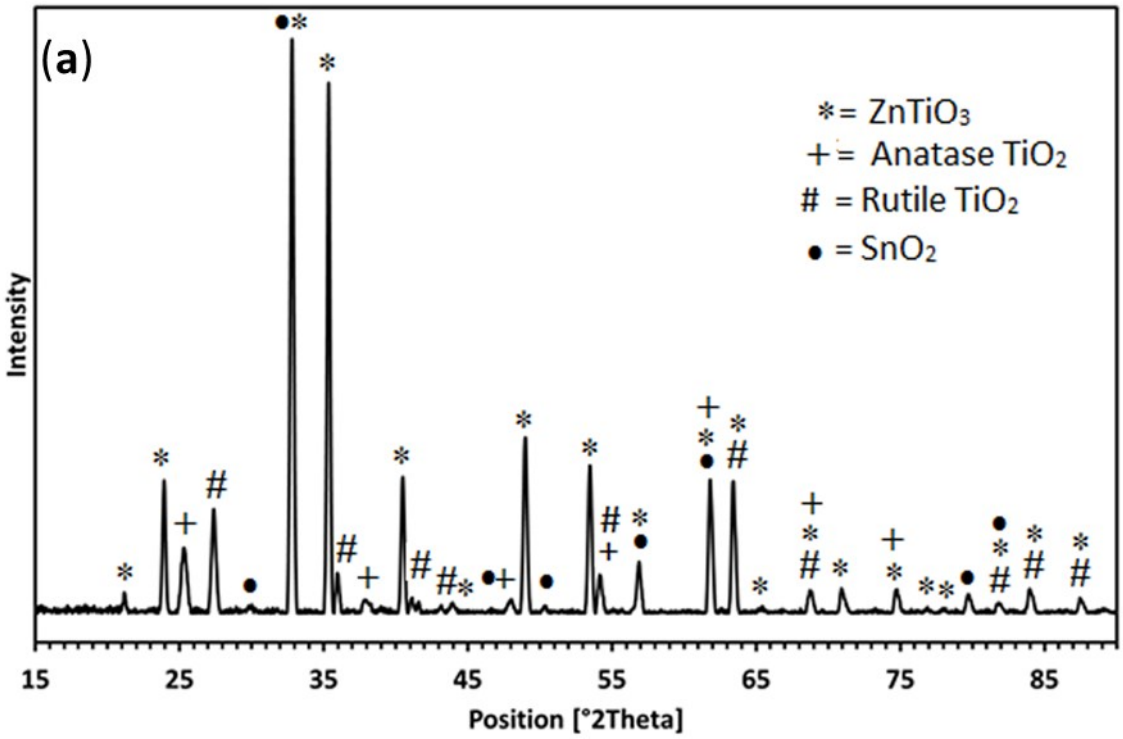

Fig. S3a: XRD parren of $ZnTiO_3$-TiO_2 composite thin film deposited from methanol solution of (**1**) on crystalline FTO glass substrate at 550 °C.

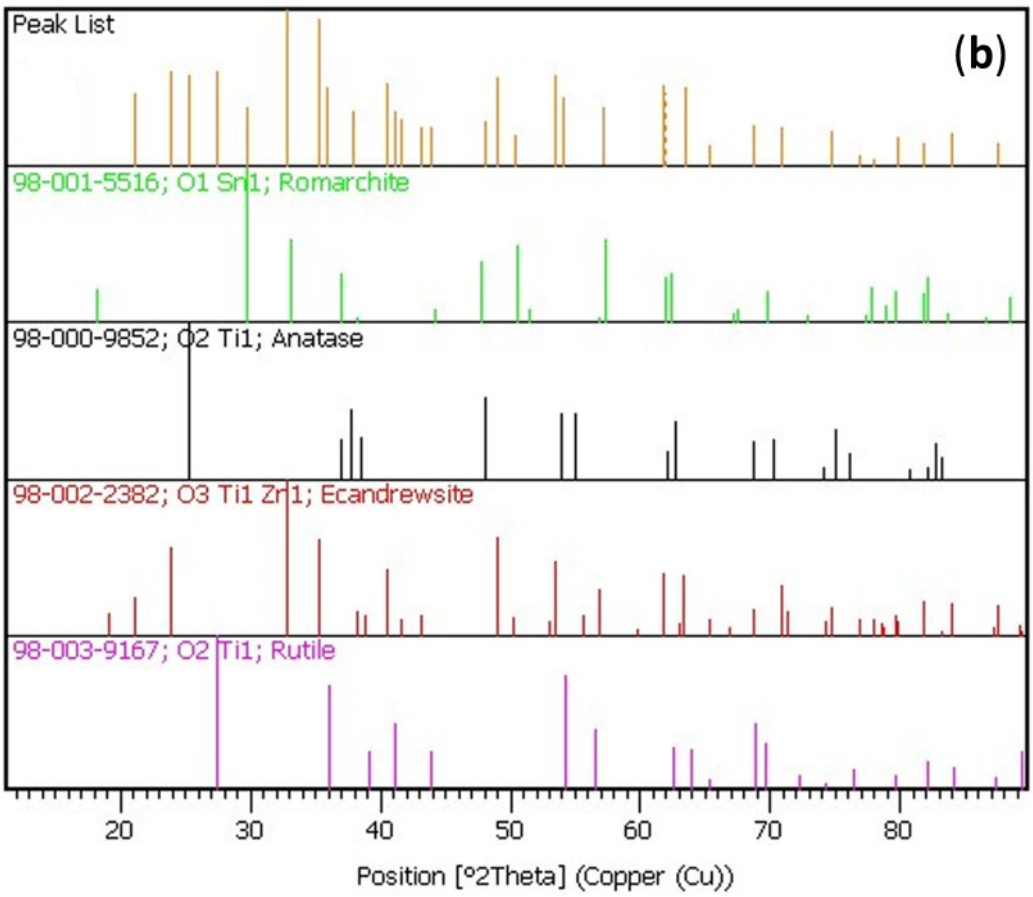

Fig. S3b: Comparisons of XRD patterns of $ZnTiO_3$-TiO_2 composite thin film deposited from methanolic solution of (**1**) on crystalline FTO substrate with standard ICSD; SnO (green lines) (98-001-5516), anatase TiO_2 (black lines) (98-000-9852), ecandrewsite $ZnTiO_3$ (ICSD 98-002-2382) (red lines), rutile TiO_2 (violet lines) (98-003-9167).

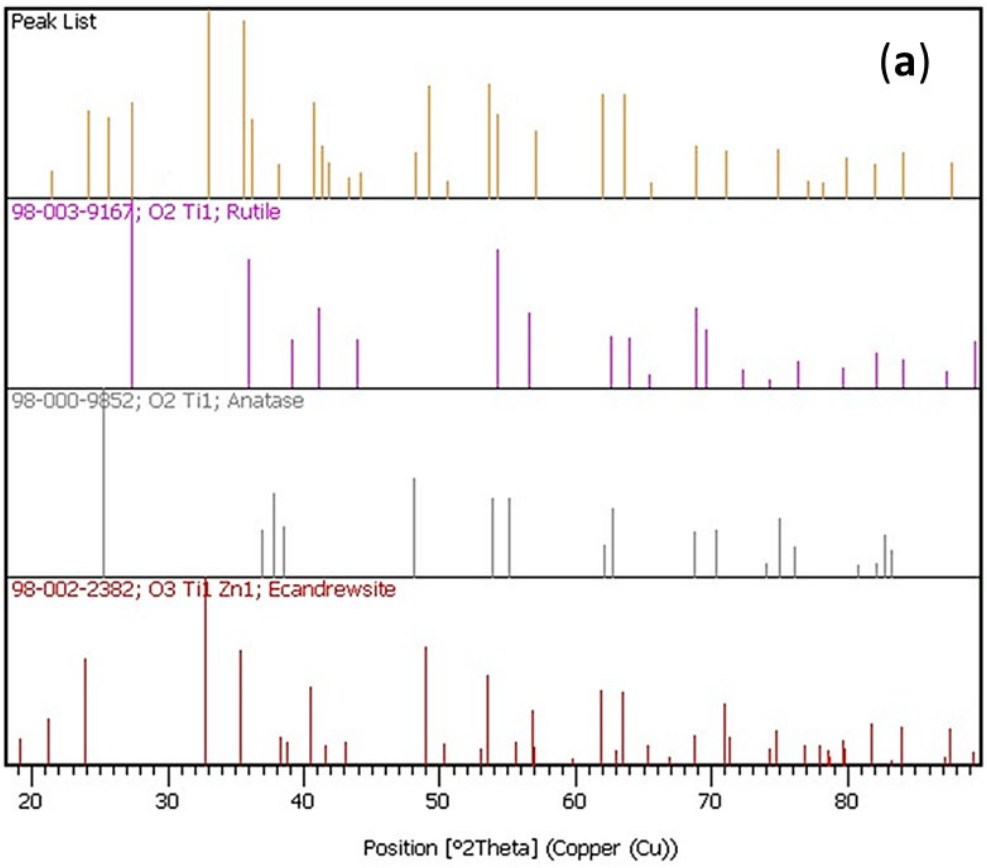

Fig. S4a: Comparisons of XRD pattern of $ZnTiO_3$-TiO_2 composite thin film deposited from methanolic solution of (**1**) on plain glass with the standard ICSD; rutile TiO_2 (violet lines) (98-003-9167), anatase TiO_2 (grey lines) (98-000-9852) and ecandrewsite (red lines) $ZnTiO_3$ (ICSD 98-002-2382).

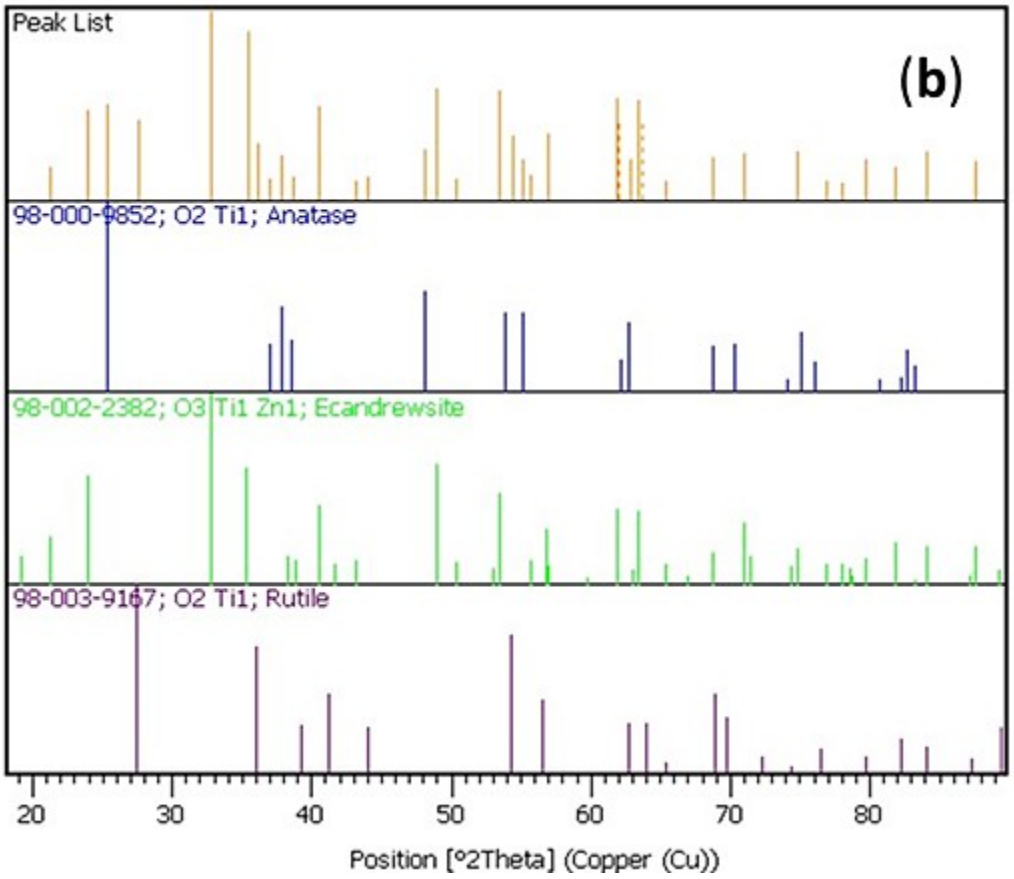

Fig. S4b: Comparisons of XRD patterns of $ZnTiO_3$-TiO_2 composite thin film deposited from THF solution of (**1**) on plain glass with the standard ICSD; anatase TiO_2 (blue lines) (98-000-9852), ecandrewsite $ZnTiO_3$ (98-002-2382) (green lines), rutile TiO_2 (violet lines) (98-003-9167) .

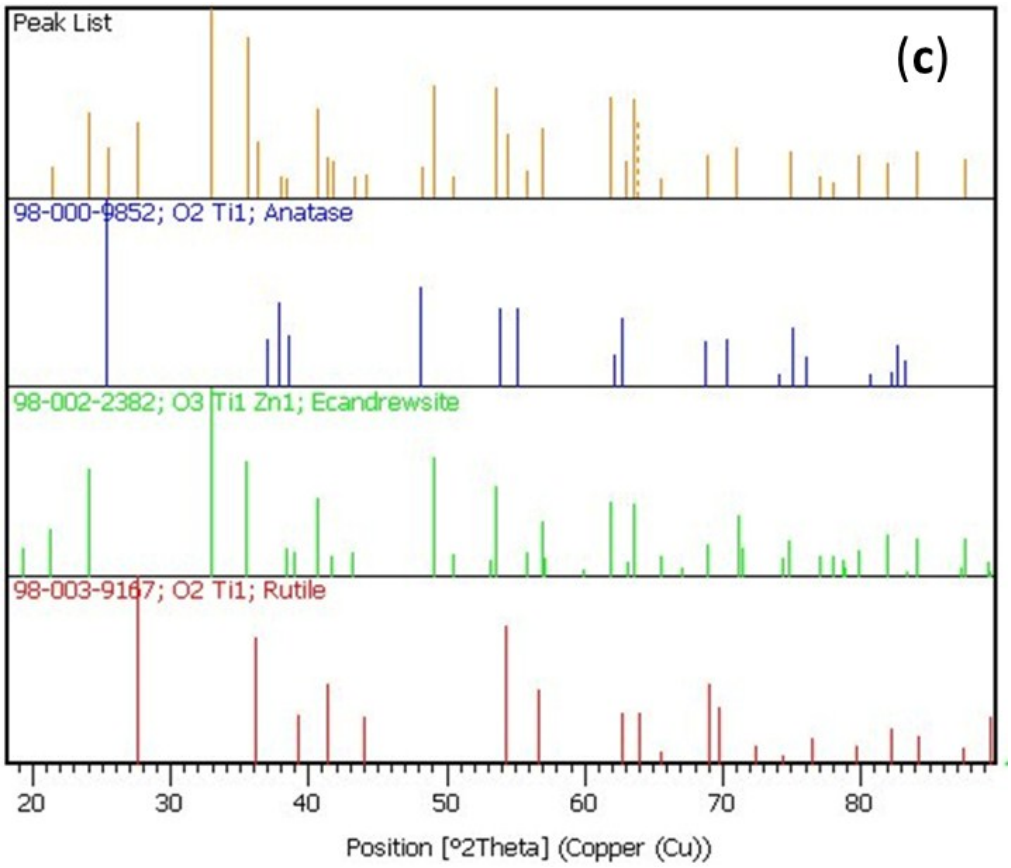

Fig. S4c: Comparisons of XRD pattern of $ZnTiO_3$-TiO_2 composite thin film deposited from ACN solution of (**1**) on plain glass with the standard ICSD; anatase TiO_2 (blue lines) (98-000-9852), ecandrewsite $ZnTiO_3$ (98-002-2382) (green lines), rutile TiO_2 (violet lines) (98-003-9167) .

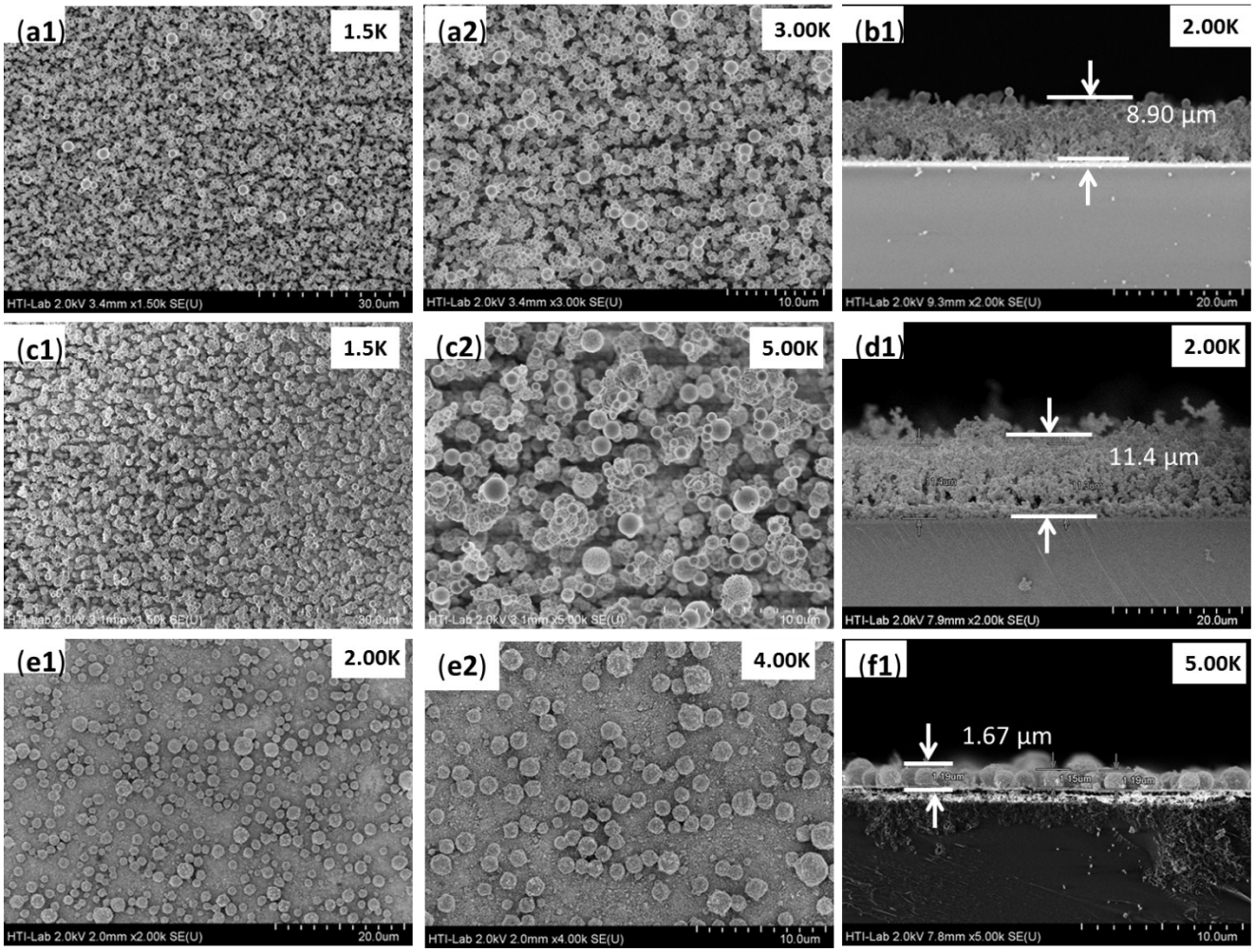

Fig. S5 : (**a**), (**c**) and (**e**) show surface ; (**b**), (**d**) and (**f**) indicate the cross section SEM images of $ZnTiO_3$-TiO_2 composite thin films deposited on FTO glass substrate at 550 °C from solution of precursor (**1**) in (**a, b**) methanol (**c, d**) THF and (**e, f**) acetonitrile, respectively.

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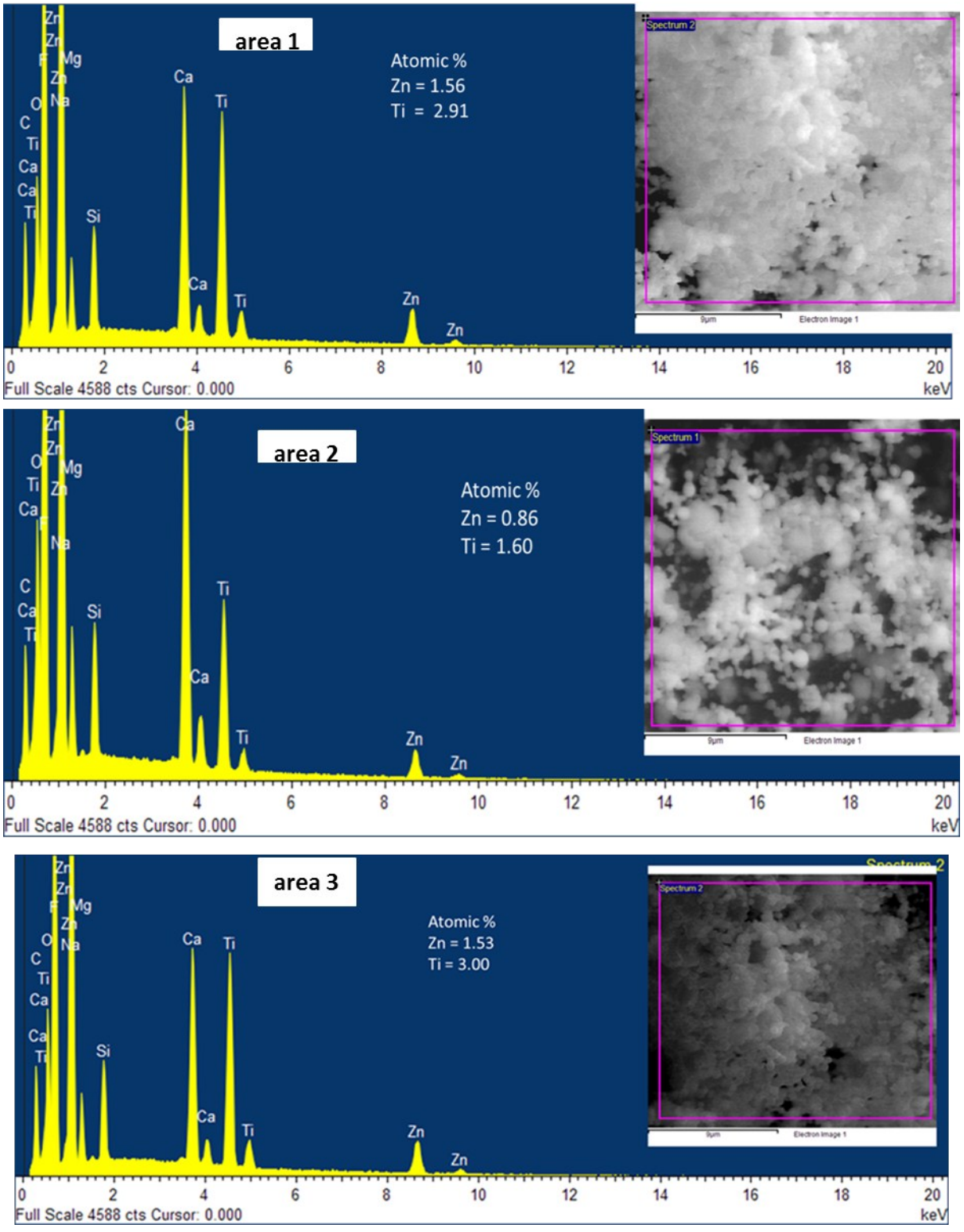

Fig. S6: EDX spectrum recorded from different areas of $ZnTiO_3$-TiO_2 composite film deposited from methanol solution of (**1**) on FTO substrate at 550 ˚C in air atmosphere.

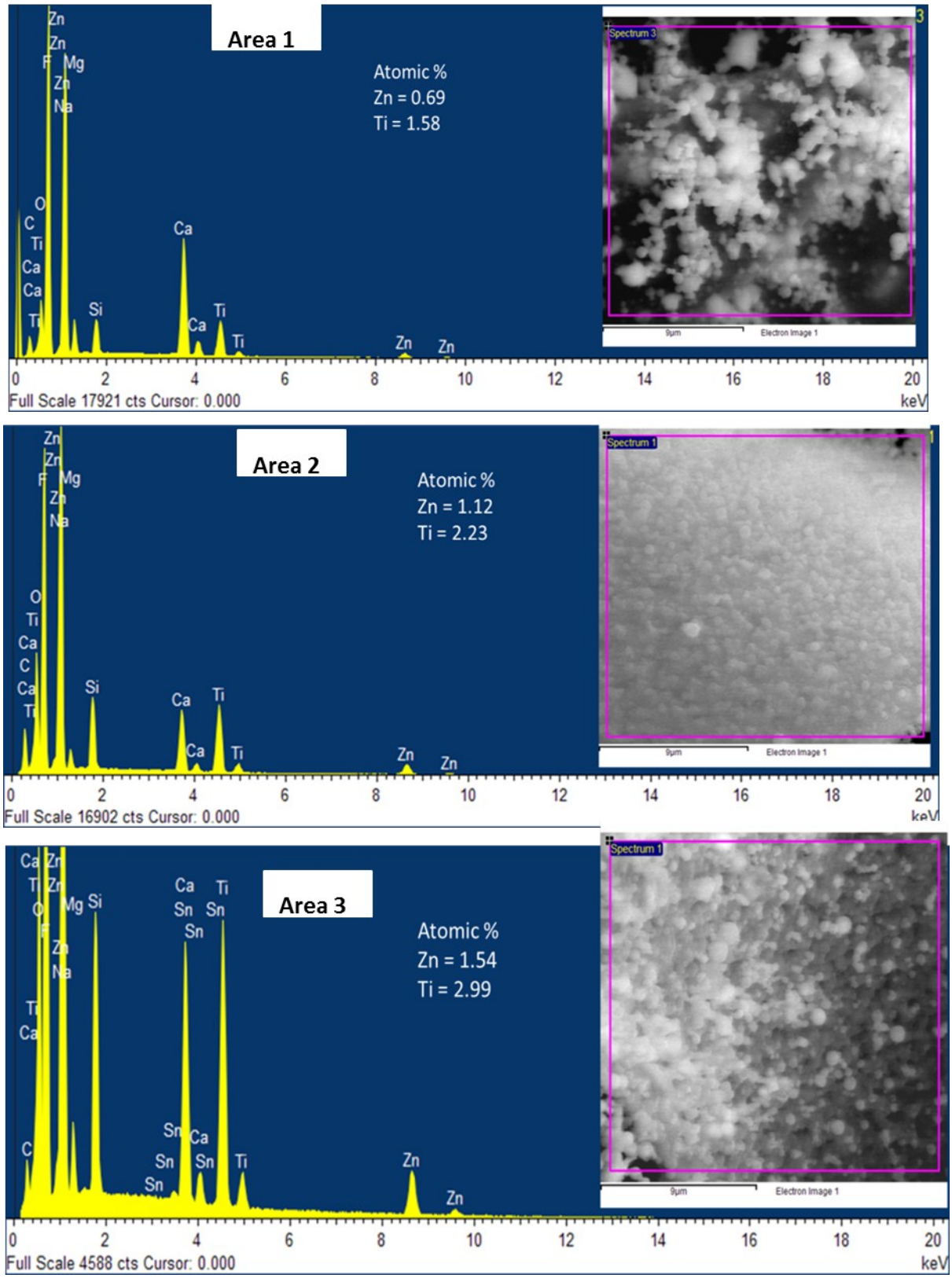

Fig. S7: EDX spectrum recorded from different areas of $ZnTiO_3$-TiO_2 composite film deposited fromTHF solution of (**1**) on FTO substrate at 550 ˚C in air atmosphere.

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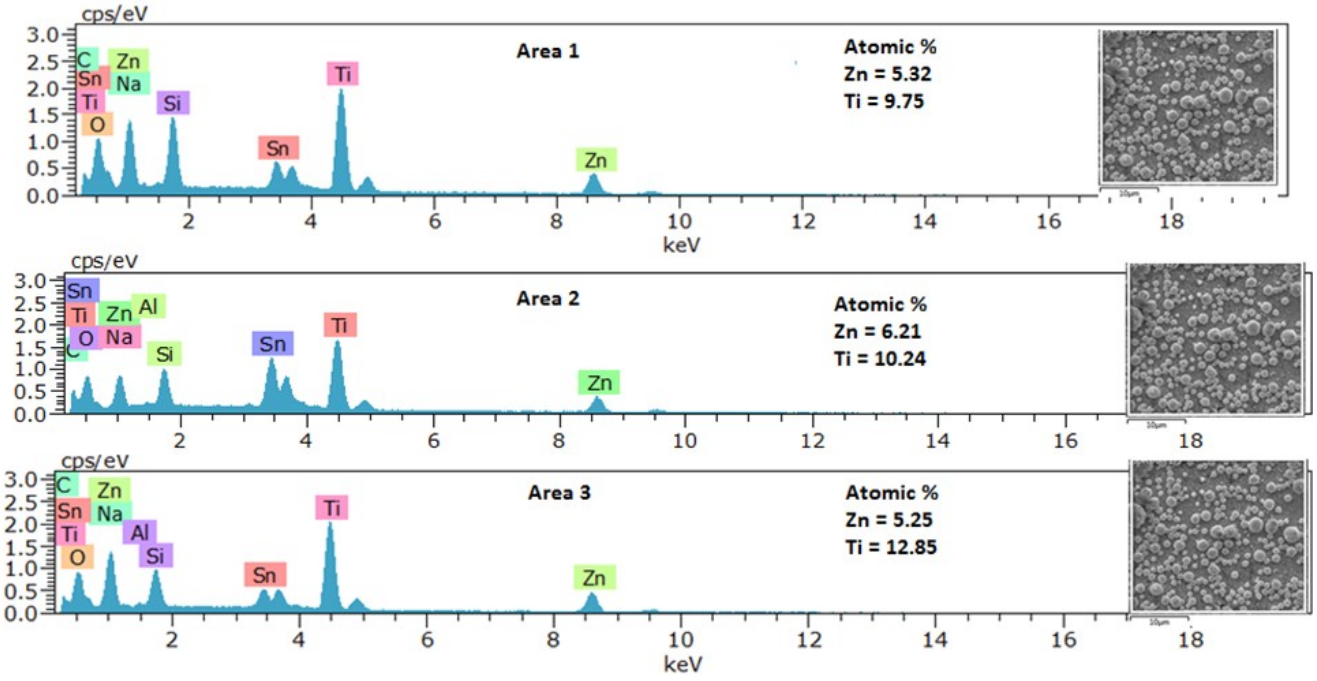

Fig. S8: EDX spectrum recorded from different areas of $ZnTiO_3$-TiO_2 composite film deposited from ACN solution of (**1**) on FTO substrate at 550 ˚C in air atmosphere

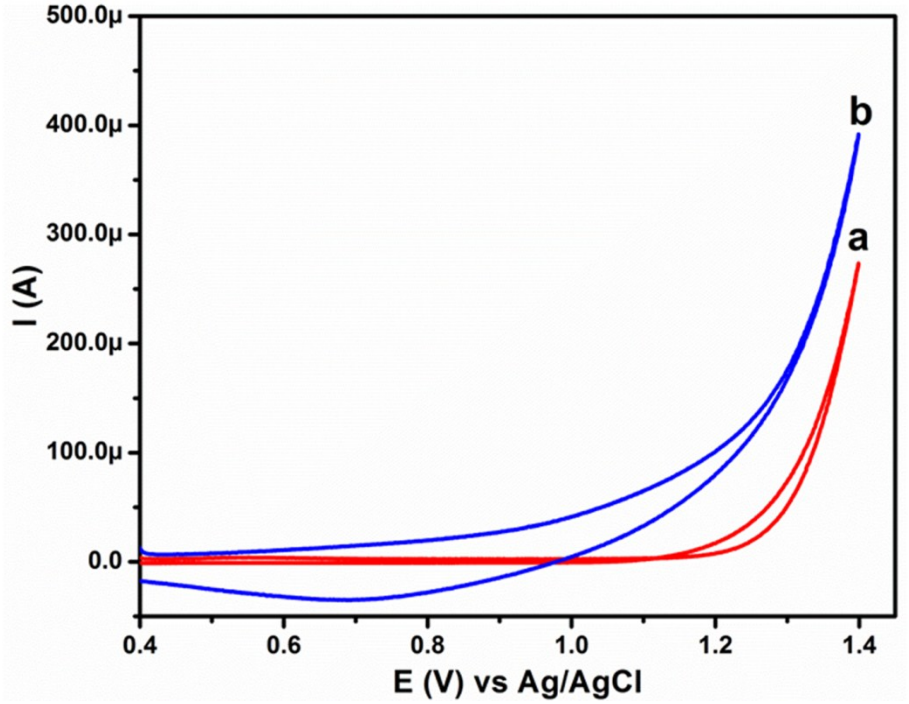

Fig. S9: Cyclic voltammograms obtained for the bare FTO electrode (**a**) absence and (**b**) presence of 1 mM nitrite in 0.1 M PBS (pH 7.2) at a scan rate of 50 mV s^{-1}.

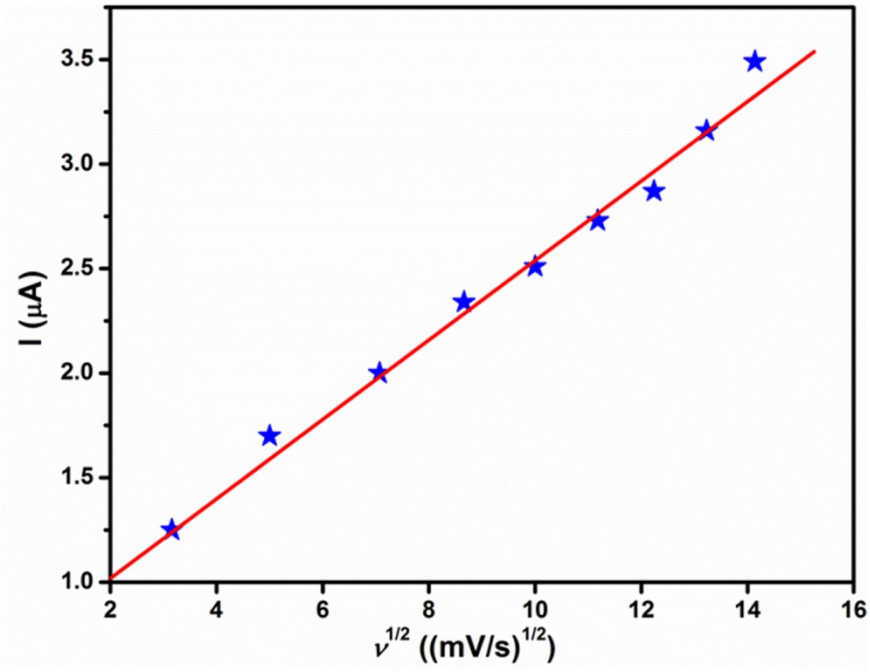

Fig. S10: Plot of peak current *vs.* square root of scan rate obtained for the $ZnTiO_3$-TiO_2 composite thin film in the presence of 1 mM nitrite in 0.1 M PBS (pH 7.2).

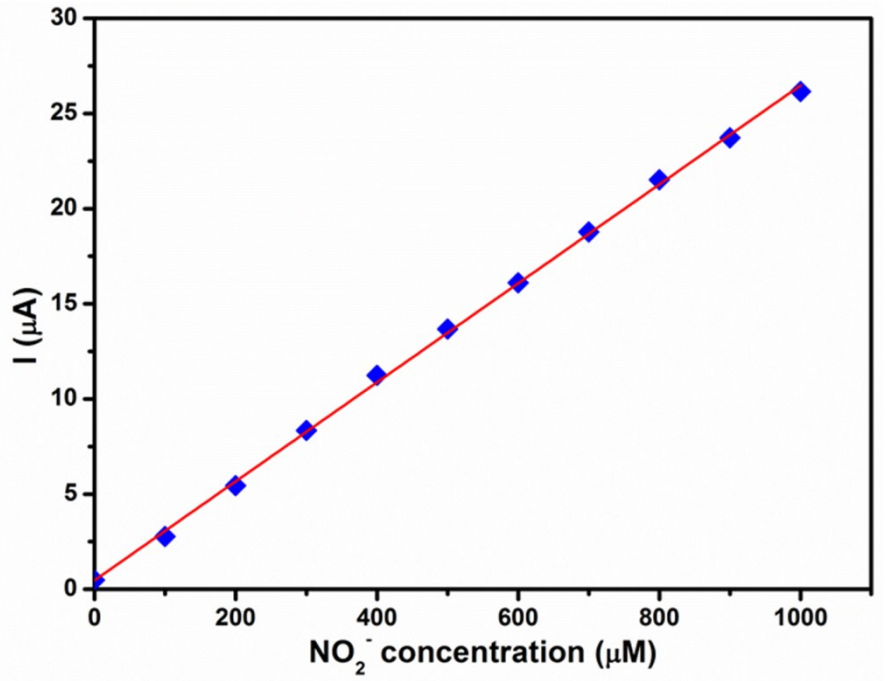

Fig. S11: Plot of peak current *vs.* nitrite concentration obtained for the $ZnTiO_3$-TiO_2 composite thin film for each addition of 10 μM nitrite in 0.1 M PBS (pH 7.2) at a scan rate of 50 mV s^{-1}.

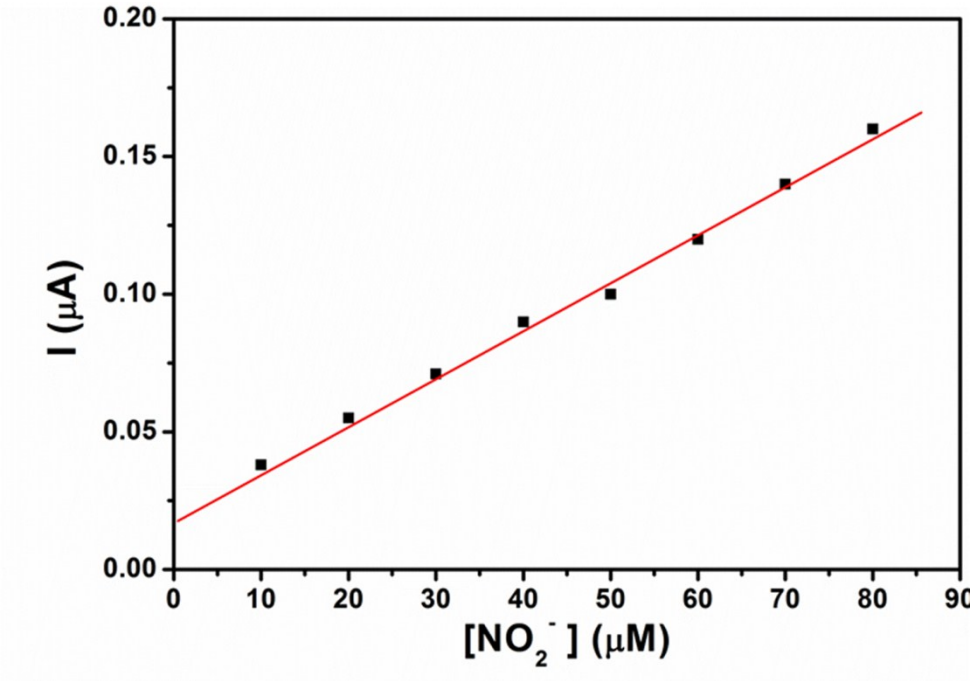

Fig. S12: Plot of peak current *vs.* nitrite concentration obtained for the $ZnTiO_3$-TiO_2 composite thin film for various addition nitrite in 0.1 M PBS (pH 7.2) at a regular time interval of 60 sec (applied potential was +1.2 V).