

## Surface ionic states and structure of titanate nanotubes

Sesha Vempati,<sup>a\*</sup> Fatma Kayaci,<sup>a,b</sup> Cagla Ozgit-Akgun,<sup>a,b</sup> Necmi Biyikli<sup>a,b</sup> and Tamer Uyar<sup>a,b\*</sup>

<sup>a</sup> UNAM-National Nanotechnology Research Center, Bilkent University, Ankara, 06800, Turkey.

E-mail: SV: svempati01@qub.ac.uk; TU: uyar@unam.bilkent.edu.tr

<sup>b</sup> Institute of Materials Science and Nanotechnology, Bilkent University, Ankara, 06800, Turkey

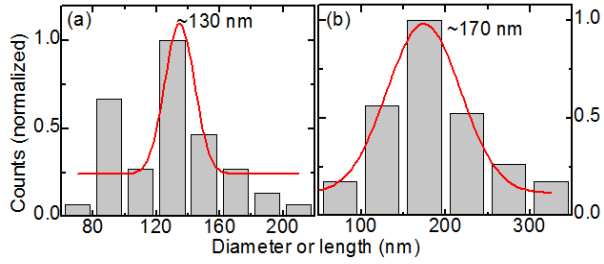
### Supplementary information

STab 1: Literature review of the preparation of zinc titanates.

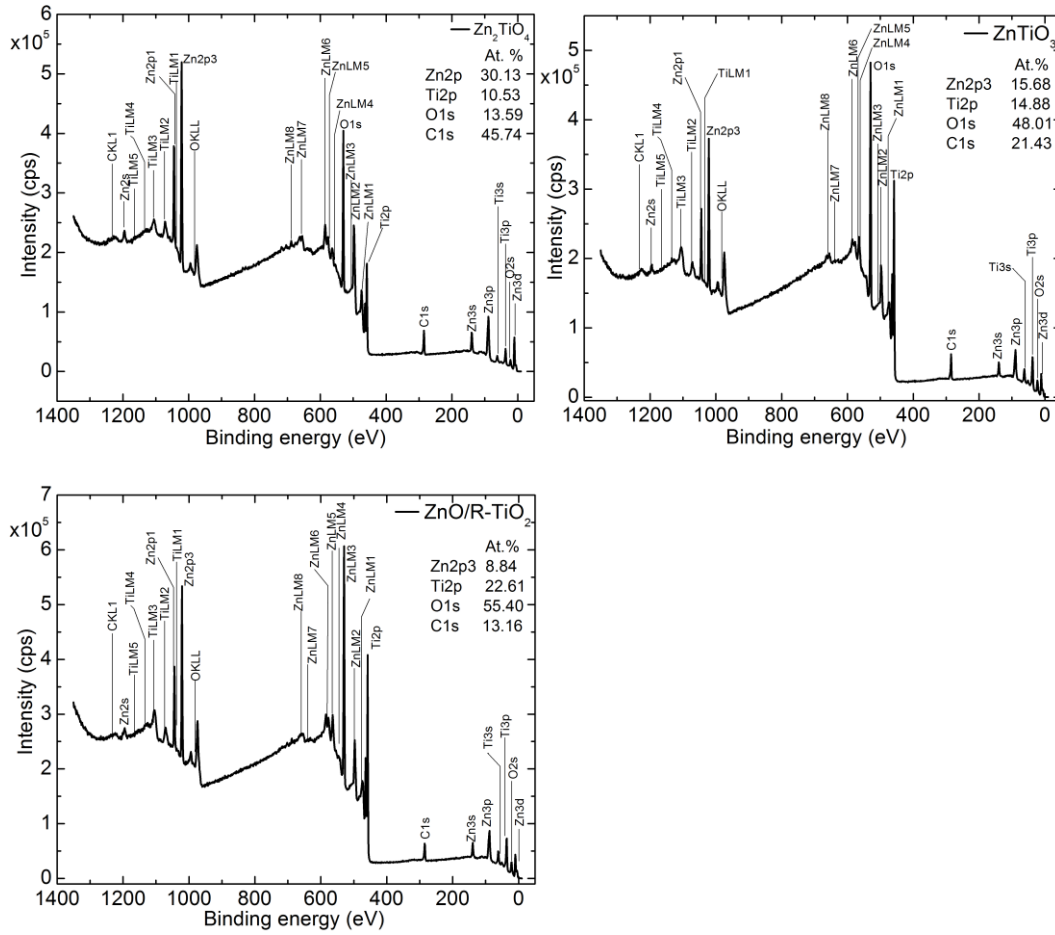
Type of reaction	Compound(s)	Temp (°C)	Duration	Phase information/comment	Ref
Citrate method	Zinc titanate	720	12h	-	[1]
Sol-gel	<i>c</i> -ZnTiO <sub>3</sub>	700	5h	Rh-ZnTiO <sub>3</sub>	[2]
	ZnTiO <sub>3</sub>	700	2h	Amorphous-ZnTiO <sub>3</sub> , Zn <sub>2</sub> TiO <sub>4</sub> , R-TiO <sub>2</sub>	[3]
	Crystalline-ZnTiO <sub>3</sub>	900	2h	Zn <sub>2</sub> TiO <sub>4</sub> , R-TiO <sub>2</sub>	[3]
	<i>h</i> -ZnTiO <sub>3</sub>	800	NA	Zn <sub>2</sub> TiO <sub>4</sub> , R-TiO <sub>2</sub>	[4]
	nanocrystalline ZnTiO <sub>3</sub>	400		Amorphous	[5]
	<i>c</i> -ZnTiO <sub>3</sub>	800	3h	R-TiO <sub>2</sub> , Zn <sub>2</sub> TiO <sub>4</sub> : 27.4, 42.7°	[5]
	<i>c</i> -ZnTiO <sub>3</sub>	900 W, μ-wave heating	10 min	Broad and low intensity peaks oriented in (311) plane	[5]
	Rh-ZnTiO <sub>3</sub>	500	1h	<i>c</i> -ZnO, <i>c</i> -Zn <sub>2</sub> TiO <sub>4</sub>	[6]
Sol-gel/Pechini	ZnTiO <sub>3</sub>	800	6h	Zn <sub>2</sub> TiO <sub>4</sub> , R-TiO <sub>2</sub>	[7]
Pechini	ZnTiO <sub>3</sub>	800	6h	R-TiO <sub>2</sub> , Zn <sub>2</sub> TiO <sub>4</sub>	[8]
High energy ball milling	ZnTiO <sub>3</sub> , Zn <sub>2</sub> TiO <sub>4</sub>	-	3h	-	[9]
	ZnTiO <sub>3</sub> , Zn <sub>2</sub> TiO <sub>4</sub>	-	6h	R-TiO <sub>2</sub>	[9]
Solid-state	Perovskite ZnTiO <sub>3</sub>	800	12h	Zn <sub>2</sub> TiO <sub>4</sub> , R-TiO <sub>2</sub>	[10]
Co-precipitation	Zinc titanate	700	2h	Secondary phases	[11]

### References

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*c*-cubic; Rh-Rhombohedral; R-rutile;



SFig 1: (a) diameter and (b) length of the grains observed for ZT14 after calcination.



SFig 2: X-ray photoelectron spectra depicting survey of elements. The atomic percentages are shown on the image for the three compounds.