

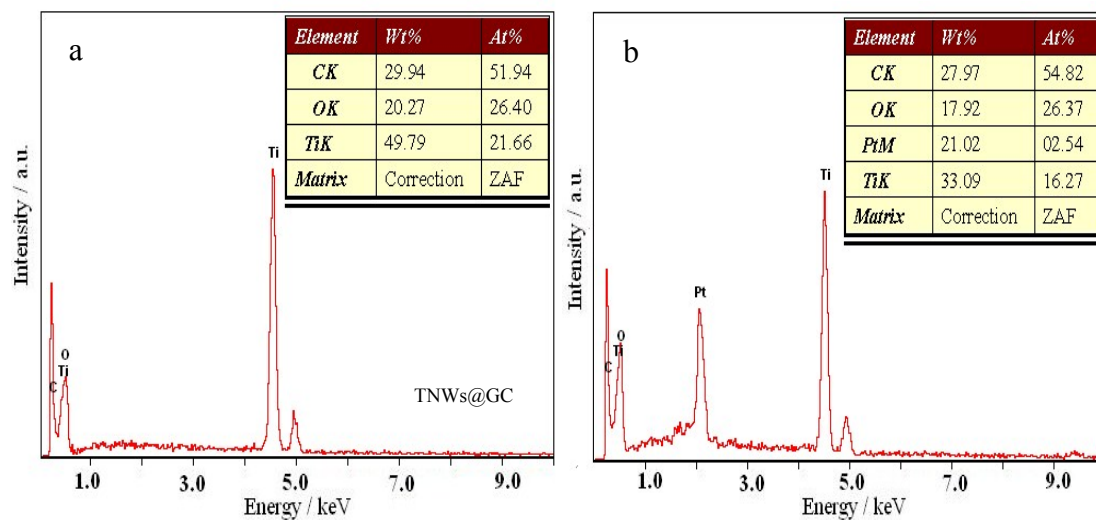
## Supporting Information

### Effect of Core/shell Structured TiO<sub>2</sub>@C Nanowires Support on the Pt Catalytic Performance for Methanol Electrooxidation

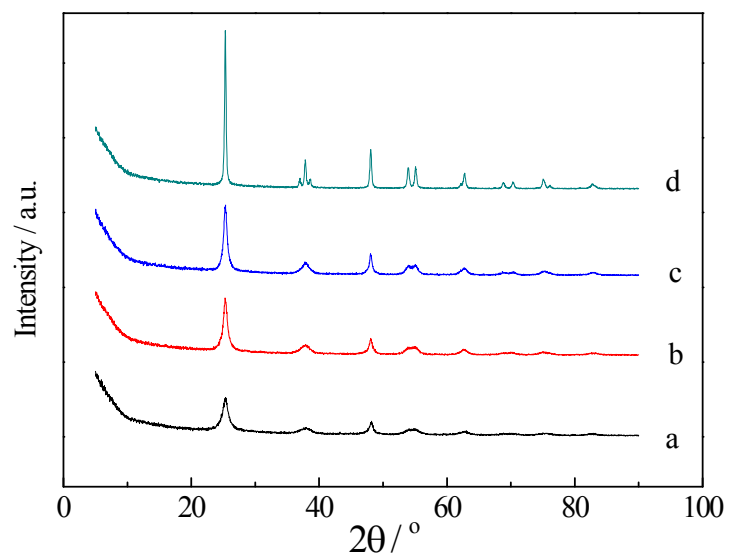
Xu-Lei Sui <sup>1,2</sup>, Zhen-Bo Wang <sup>1,\*</sup>, Cun-Zhi Li<sup>1,2</sup>, Jing-Jia Zhang <sup>1</sup>, Lei Zhao <sup>1</sup>, Da-  
Ming Gu <sup>2</sup>

<sup>1</sup> School of Chemical Engineering and Technology, Harbin Institute of Technology,  
No.92 West-Da Zhi Street, Harbin, 150001 China. E-mail: wangzjb@hit.edu.cn;  
Tel.: +86-451-86417853; Fax: +86-451-86418616

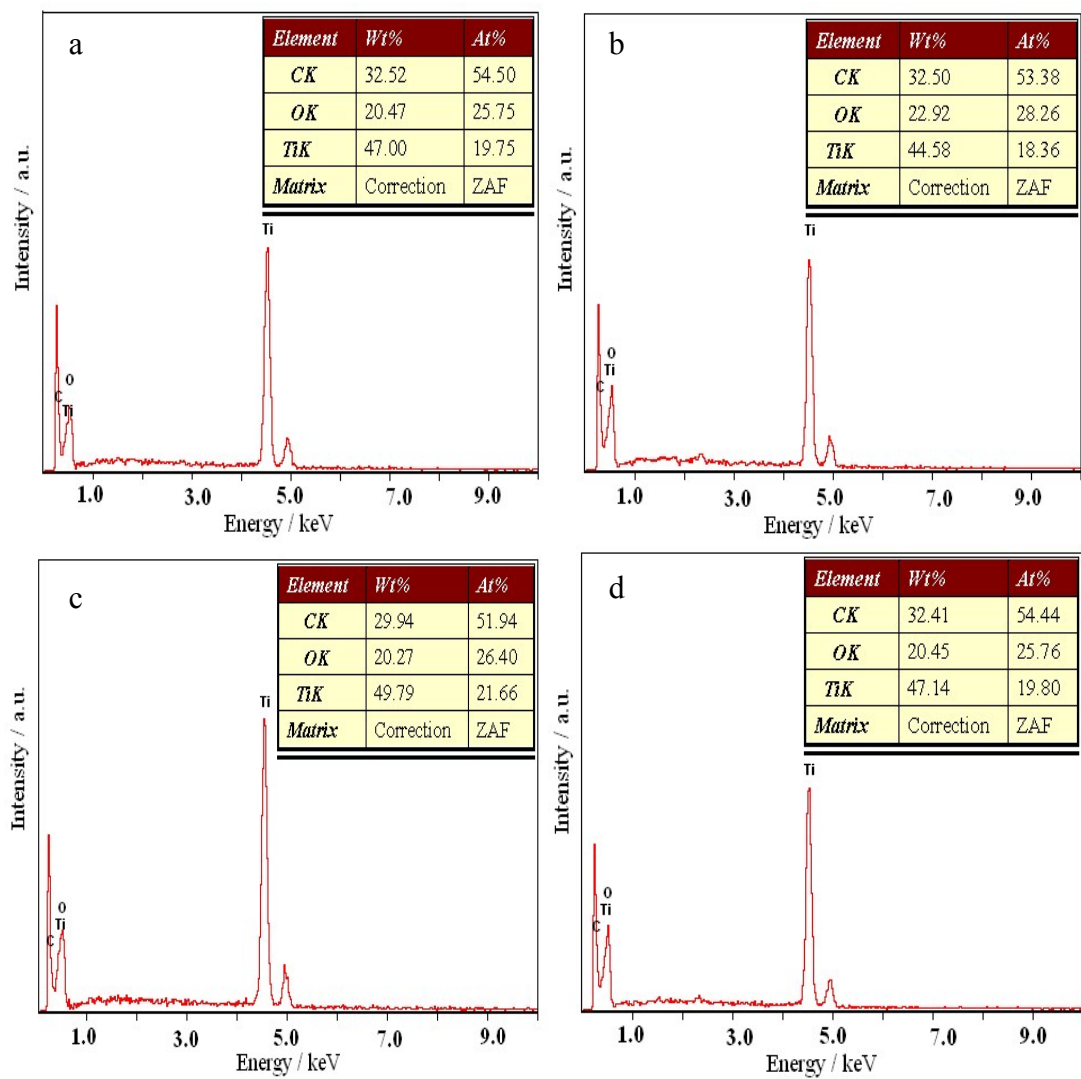
<sup>2</sup> School of Science, Harbin Institute of Technology, No.92 West-Da Zhi  
Street, Harbin, 150001 China



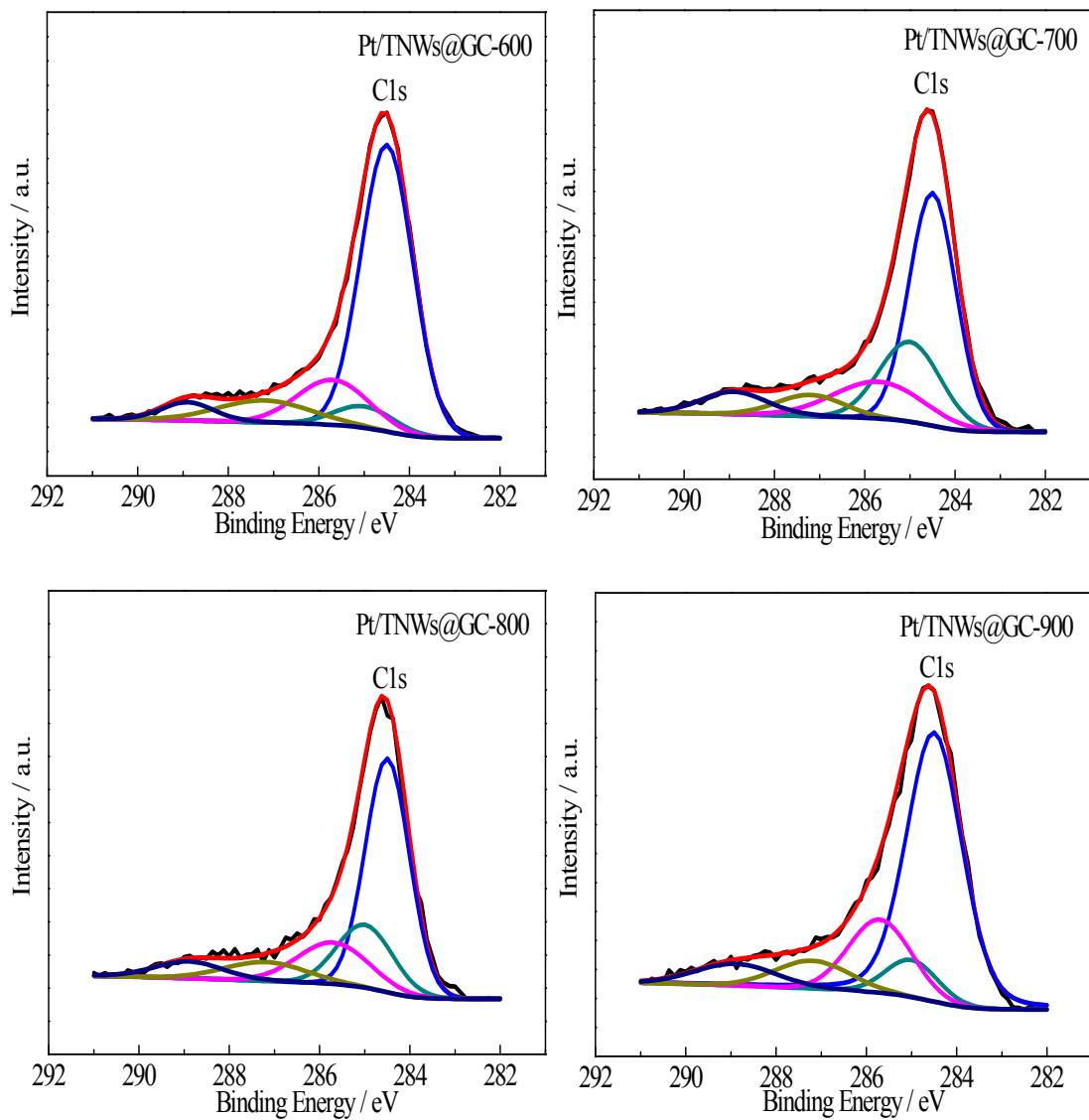
**Figure S1.** EDS of TNWs@GC (a) and Pt/TNWs@GC (b) catalysts



**Figure S2.** XRD patterns of TNWs@GC at different temperature (a: 600 °C, b: 700 °C, c: 800 °C, d: 900 °C)



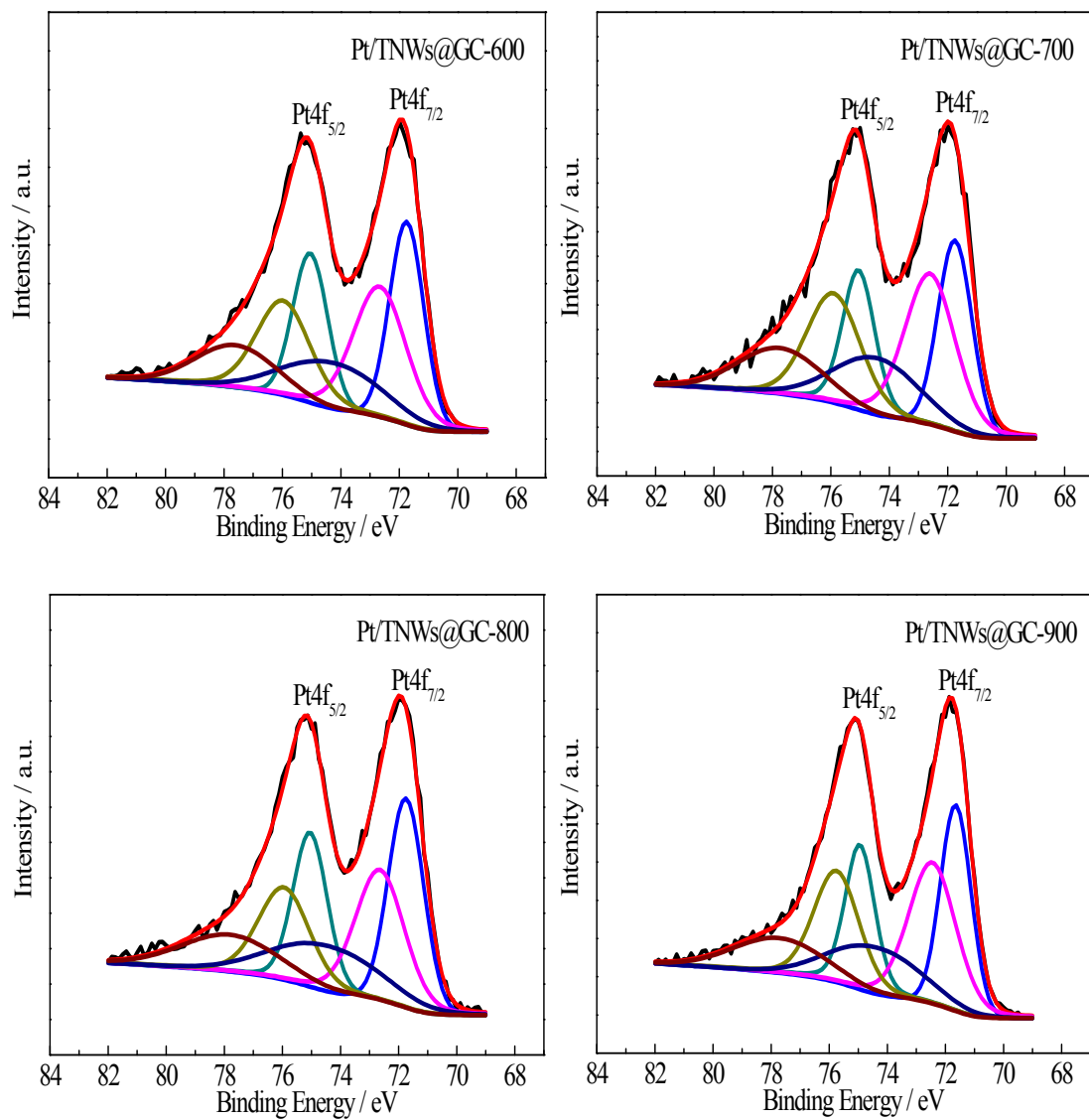
**Figure S3.** EDS of TNWs@GC at different temperature (a: 600 °C, b: 700 °C, c: 800 °C, d: 900 °C)



**Figure S4.** XPS curves of C1s peak for the different Pt/TNWs@GC

**Table S1.** Deconvoluted results of C 1s peak for the different Pt/TNWs@GC

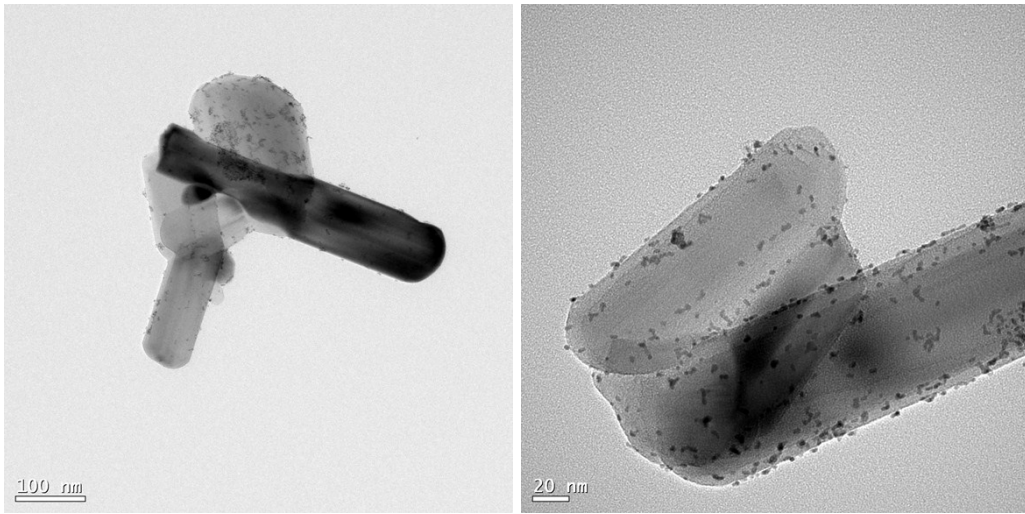
Pt/TNWs@GC	sp <sup>2</sup> -C 284.5 eV	C 285.0 eV	-C-OR 285.7 eV	>C=O 287.2 eV	-COOR 288.9 eV
600 °C	66.3 %	5.7 %	14.3 %	9.1 %	4.6 %
700 °C	49.4 %	22.2 %	14.9 %	6.4 %	7.1 %
800 °C	52.8 %	18.0 %	15.1 %	7.9 %	6.2 %
900 °C	61.4 %	7.2 %	17.1 %	7.7 %	6.6 %



**Figure S5.** XPS curves of Pt4f peak for the different Pt/TNWs@GC

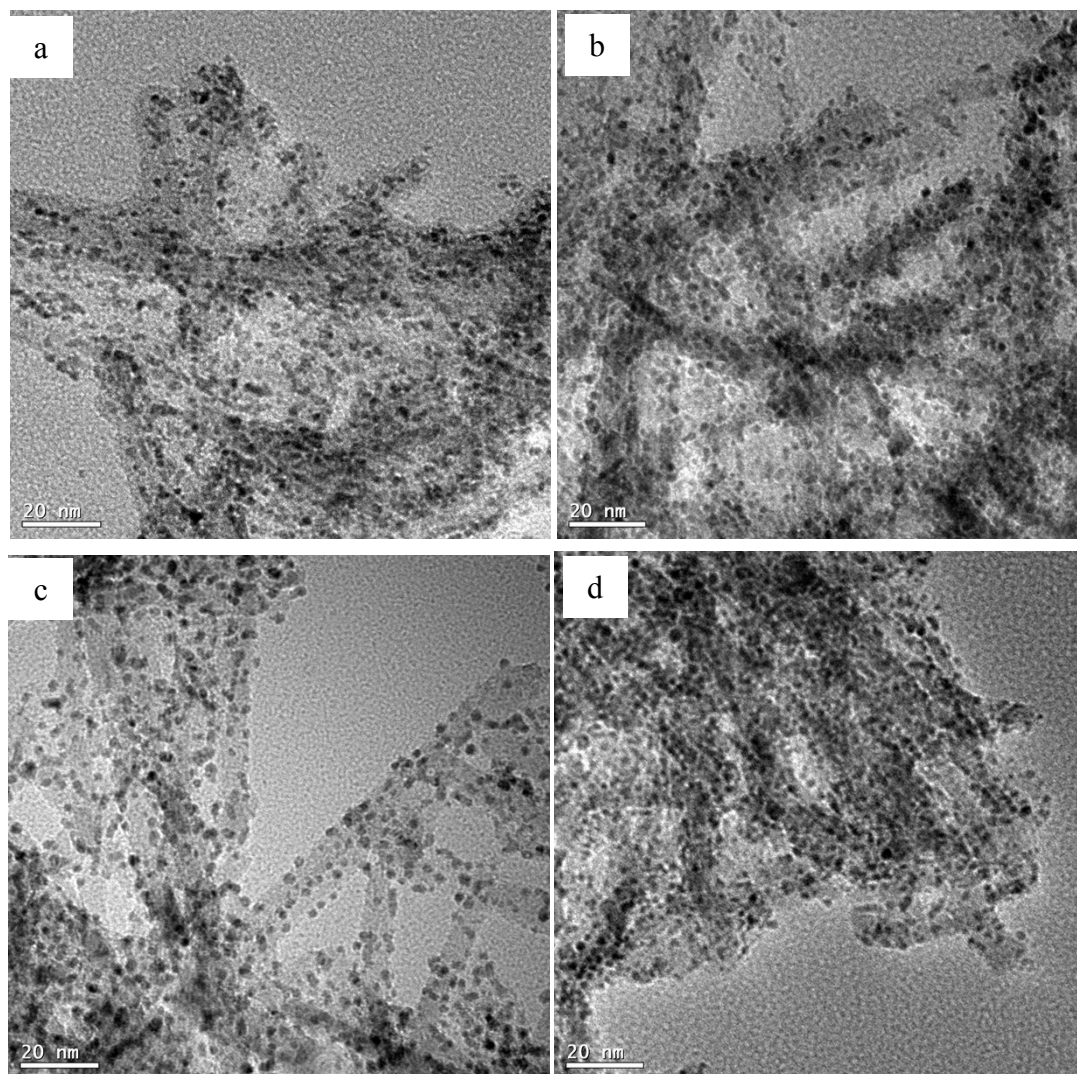
**Table S2.** Deconvoluted results of Pt4f peak for the different Pt/TNWs@GC

Pt/TNWs@GC	Pt species	Binding energy	Relative content
600 °C	Pt (0)	71.8 eV	36.9 %
	Pt (II)	72.7 eV	39.3 %
	Pt (IV)	74.3 eV	23.8 %
700 °C	Pt (0)	71.8 eV	32.6 %
	Pt (II)	72.6 eV	41.9 %
	Pt (IV)	74.4 eV	25.5 %
800 °C	Pt (0)	71.8 eV	38.4 %
	Pt (II)	72.6 eV	35.8 %
	Pt (IV)	74.5 eV	25.8 %
900 °C	Pt (0)	71.7 eV	35.4 %
	Pt (II)	72.6 eV	40.8 %
	Pt (IV)	74.4 eV	23.8 %

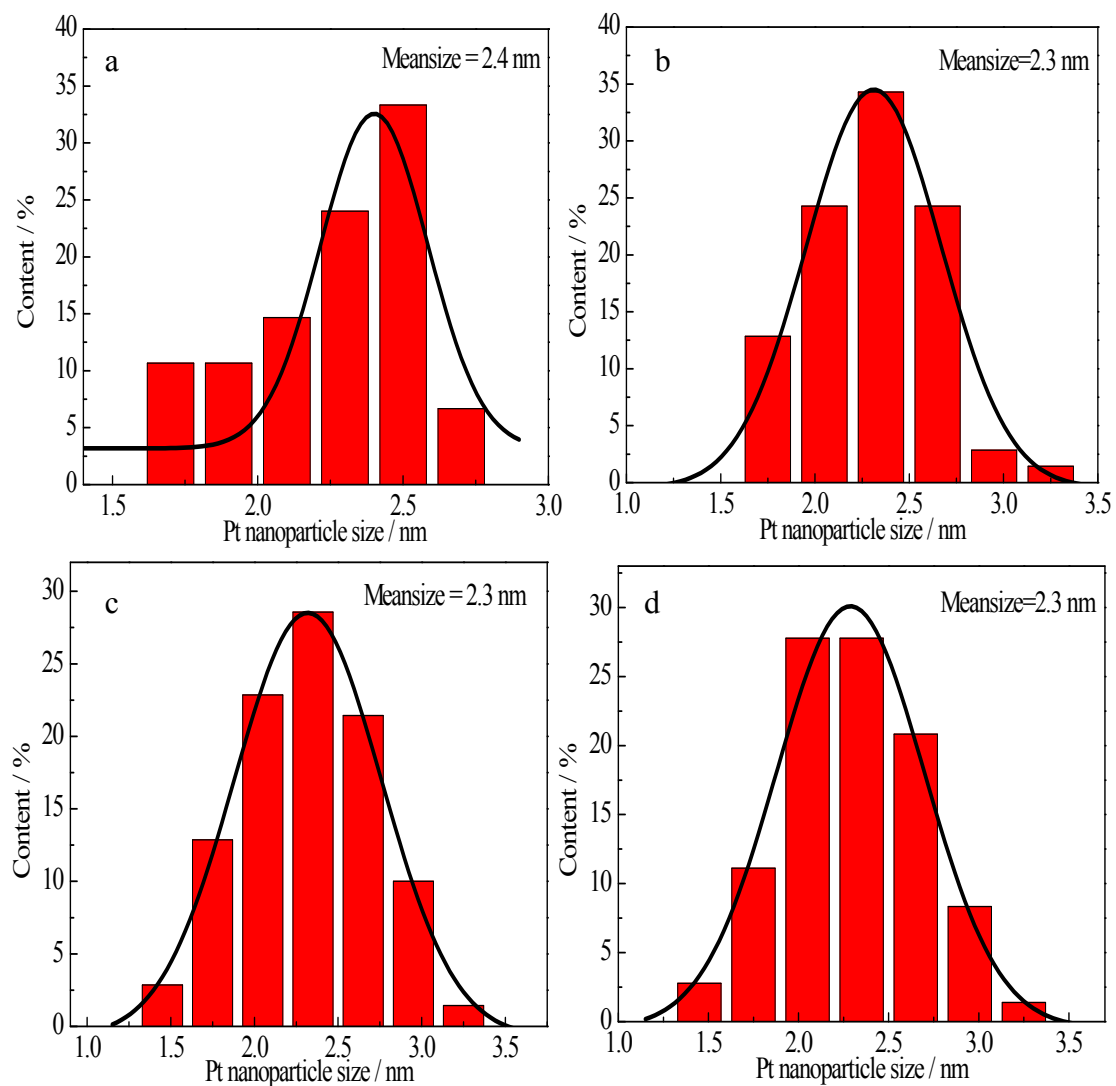


**Figure S6.** TEM images of non-carbon-coated NaTNTs after annealing at 800 °C

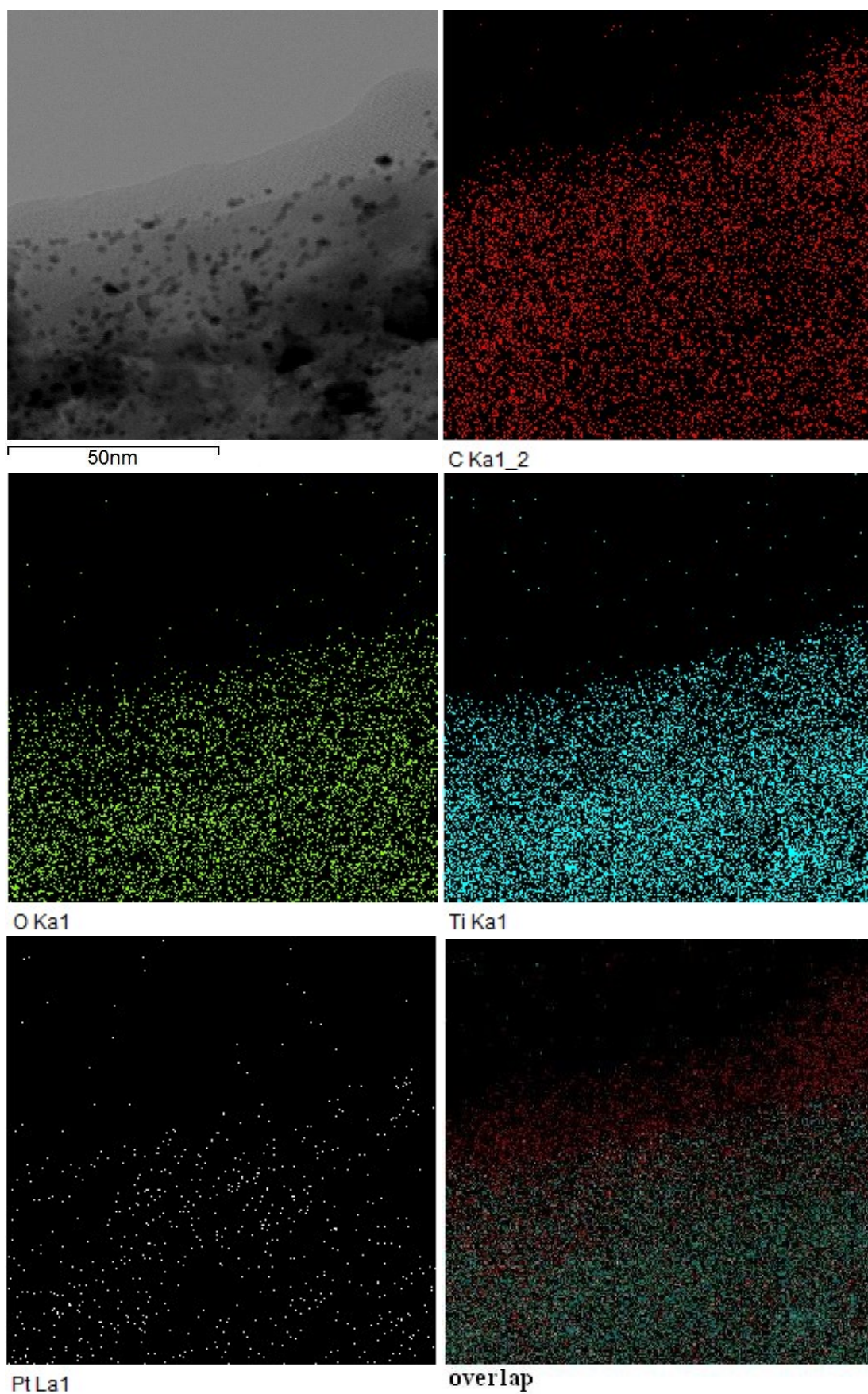




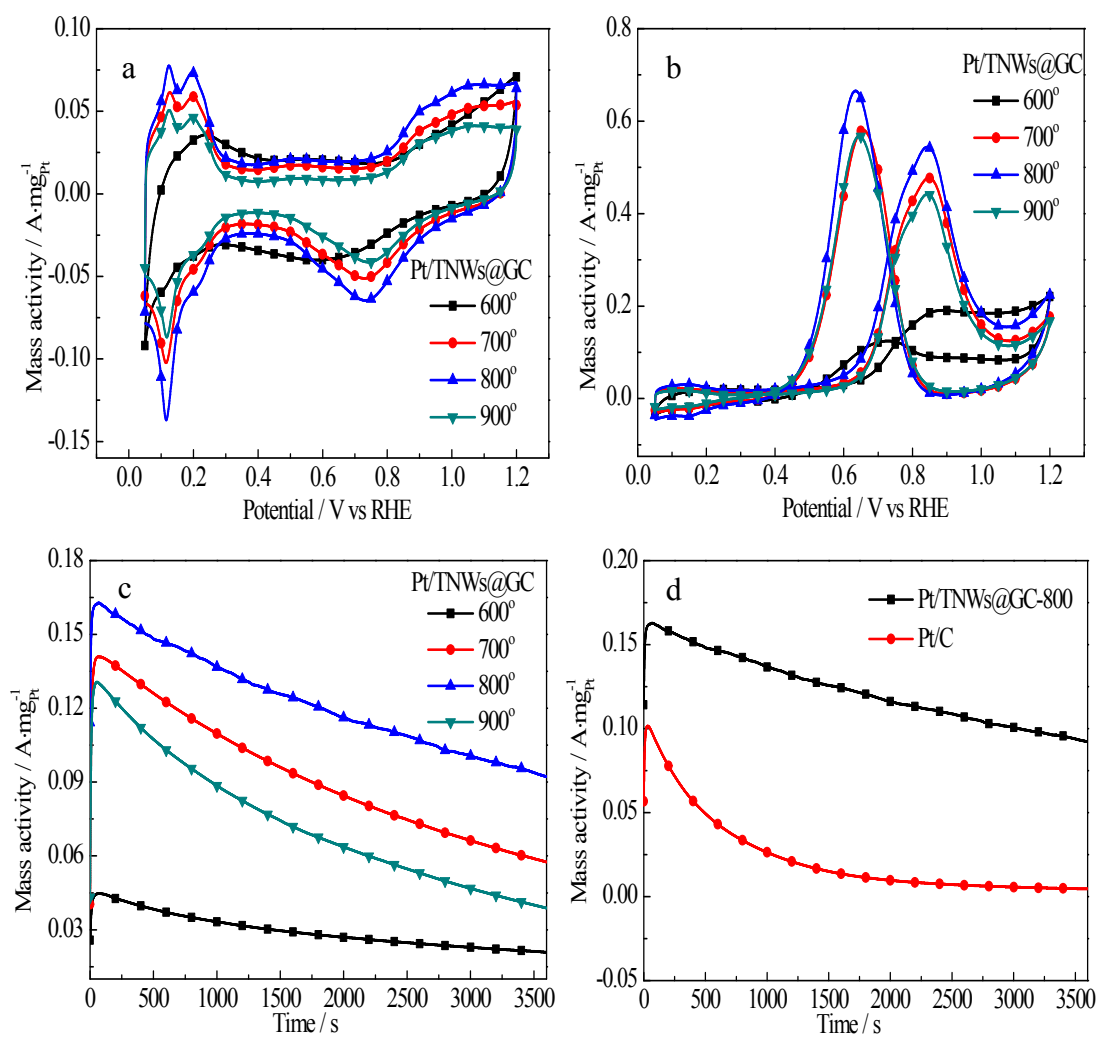
**Figure S7.** TEM images of Pt/TNWs@GC at different temperature (a: 600 °C, b: 700 °C, c: 800 °C, d: 900 °C)



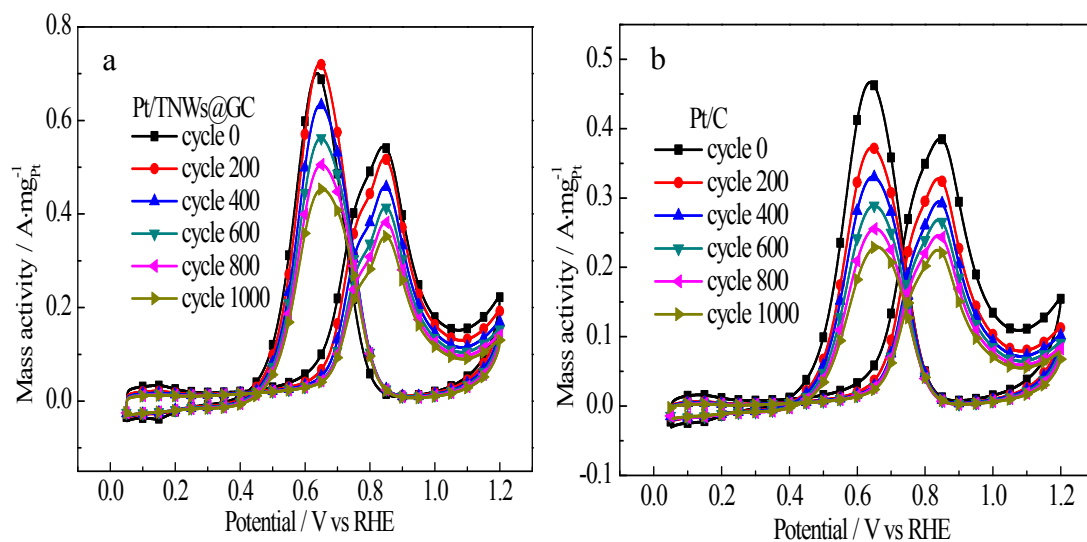
**Figure S8.** The size distributions of Pt nanoparticles on Pt/TNWs@GC (a: 600 °C, b: 700 °C, c: 800 °C, d: 900 °C)



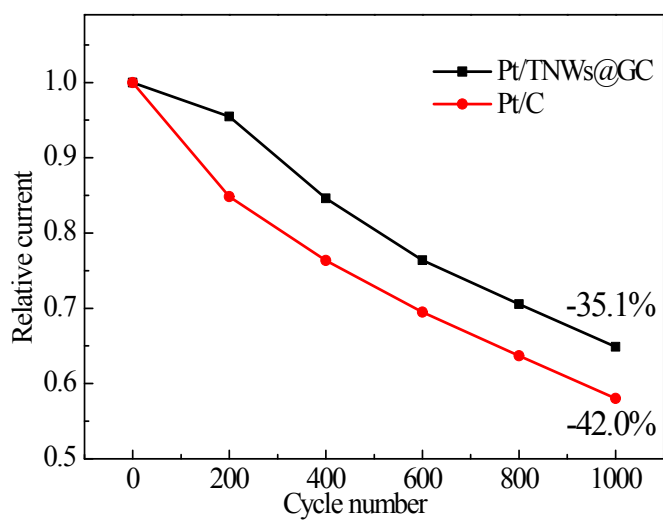
**Figure S9.** High-magnification elemental mapping of as-prepared Pt/TNWs@GC-800



**Figure S10.** Cyclic voltammogram in 0.5 mol·L<sup>-1</sup> H<sub>2</sub>SO<sub>4</sub> (a) and in methanol acidic medium (b) of the different Pt/TNWs@GC; amperometric *i-t* curves in methanol acidic medium for different catalysts (c, d)



**Figure S11.** Cycling aging test of Pt/TNWs@GC-800 (a) and Pt/C (b) catalysts



**Figure S12.** The normalized peak current density with cycle numbers