

## Electronic Supplementary Information (ESI)

### **Increasing Pt oxygen reduction reaction activity and durability with carbon-doped TiO<sub>2</sub> nanocoating catalyst support**

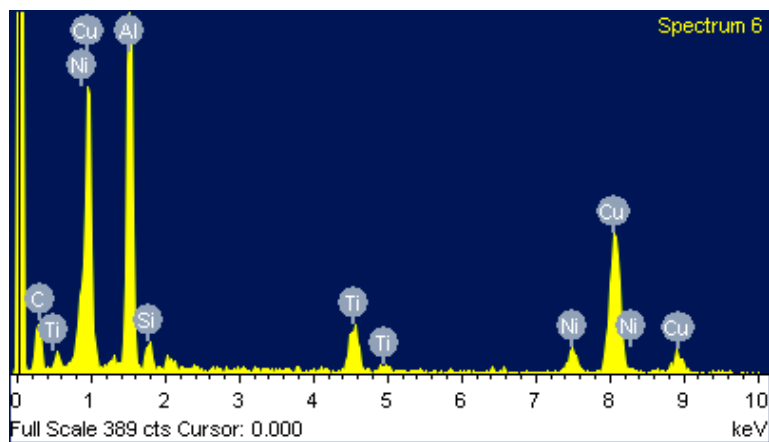
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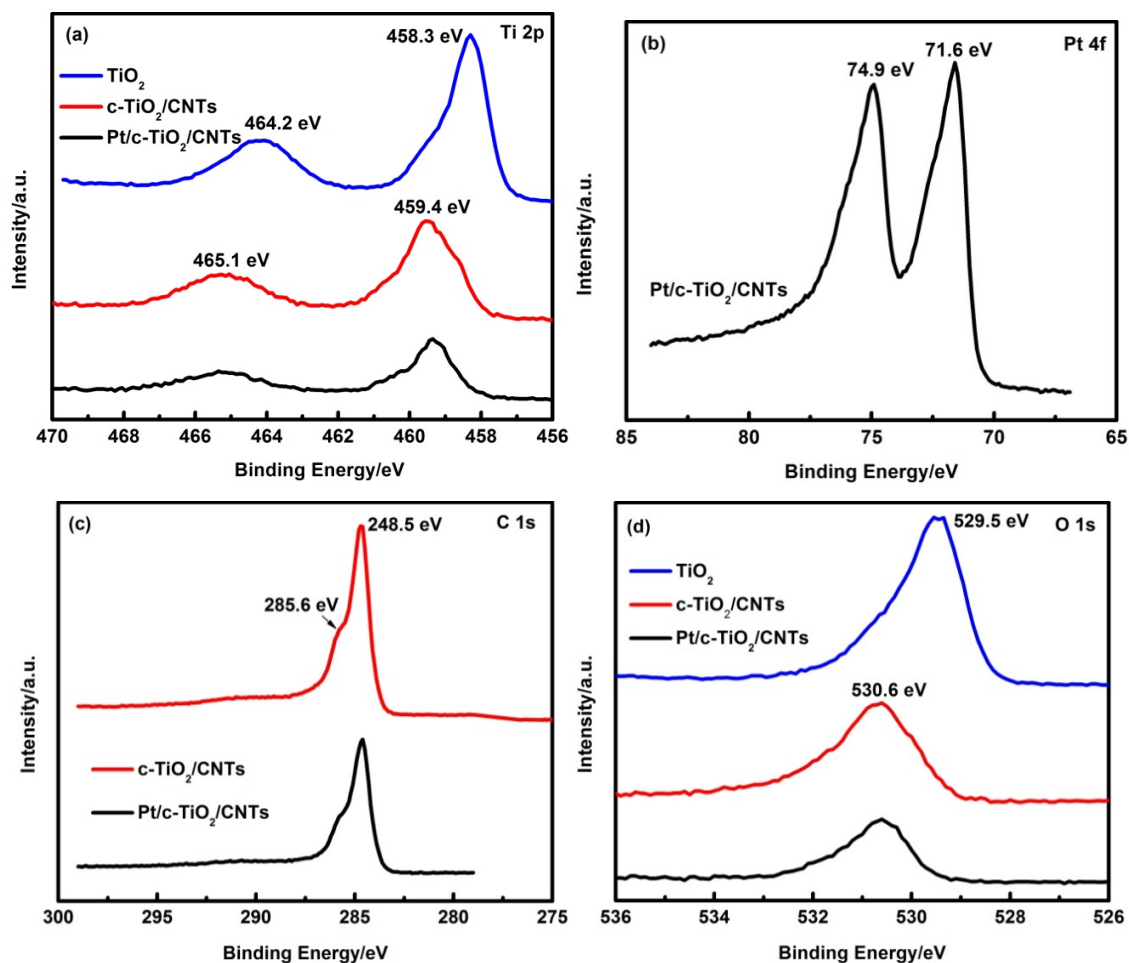
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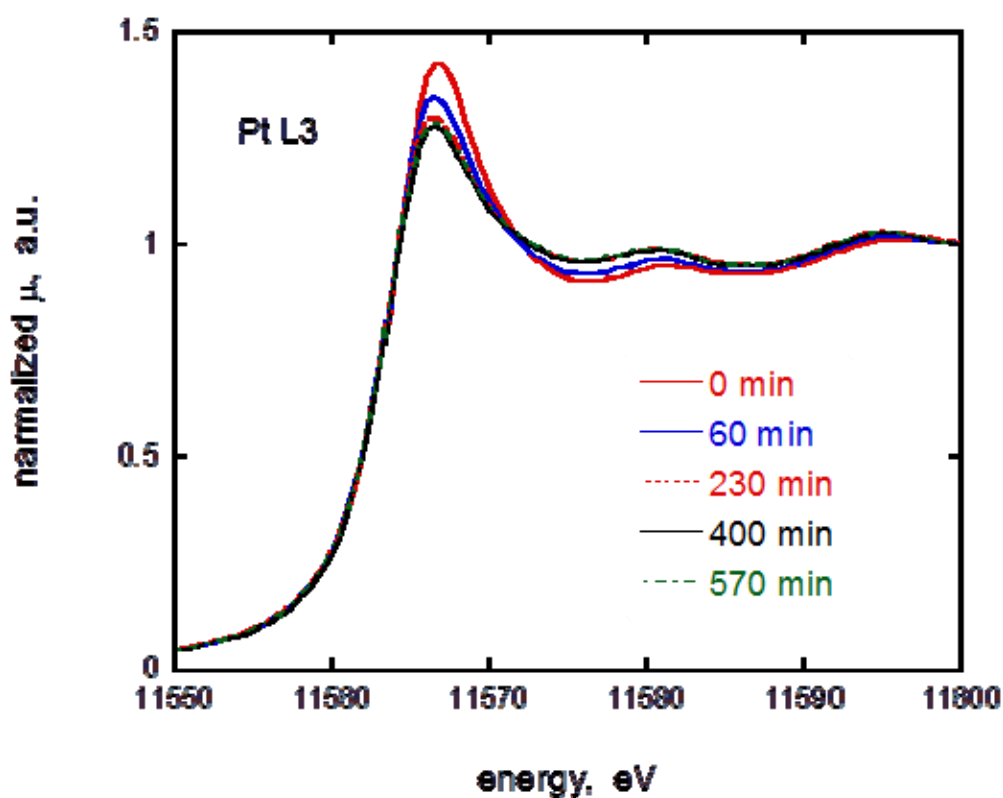
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**Fig. S1.** EDX of a  $\text{TiO}_2/\text{CNT}$  sample supported on a copper mesh TEM grid, showing the presence of Ti element. Some background elements (Cu, Ni, Al) of the sample support (TEM grid) are also present.



**Fig. S2.** Comparison of XPS results of Ti 2p, O1s, C 1s and Pt 4f from samples of pure  $\text{TiO}_2$ ,  $\text{c-TiO}_2/\text{CNTs}$  and  $\text{Pt/c-TiO}_2/\text{CNTs}$ . They show that although carbon doping shifts the binding energies, Pt deposition does not.



**Fig. S3.** In situ XANES spectra of Pt L3 edge from Pt/TiO<sub>2</sub>/CNTs in 1M HClO<sub>4</sub> at a potential of 0.41 V with polarization time.

Figure S3 shows in situ XANES spectra of Pt L3 edge from Pt/TiO<sub>2</sub>/CNTs in 1M HClO<sub>4</sub> at a potential of 0.41 V with polarization time. The intensity of the white line (the first peak) is high immediately after applying the potential, due to the presence of Pt oxides; it decays very slowly with polarization time due to reduction of the Pt oxides. The slow reduction is likely caused by the poor conductivity of the TiO<sub>2</sub> support. Such that the long delay in reduction is not observed for the conductive supports, such as Pt/c-TiO<sub>2</sub>/CNTs.