Electronic Supplementary Material (ESI) for New Journal of Chemistry

Electronic Supplementary Information

Flow-through TiO_2 Nanotube Arrays: A Modified Supporter with Homogeneous Distribution of Ag Nanoparticles and Their Photocatalytic Activities

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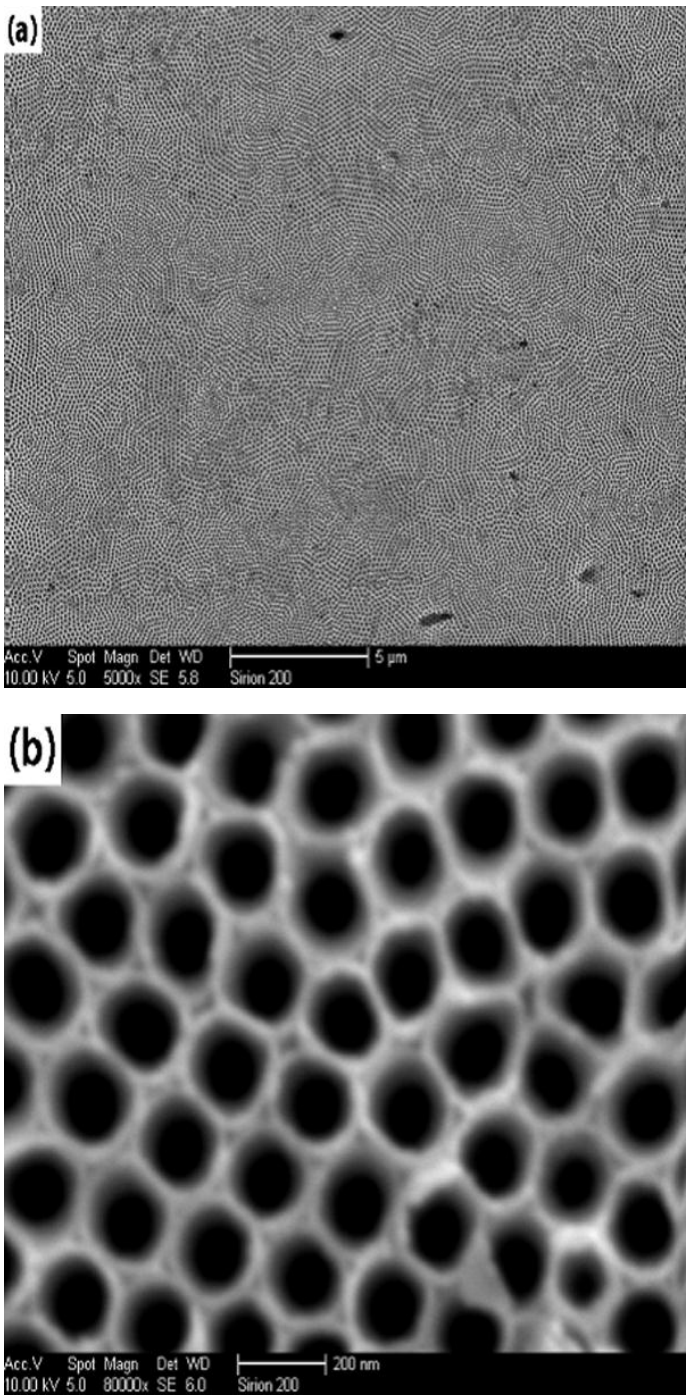


Figure S1. The overall (a) and magnified (b) SEM images showing the bottom morphology of modified f-TNTAs (breakdown at 140 V for 120 s, then anodization under 5 V for 60s).

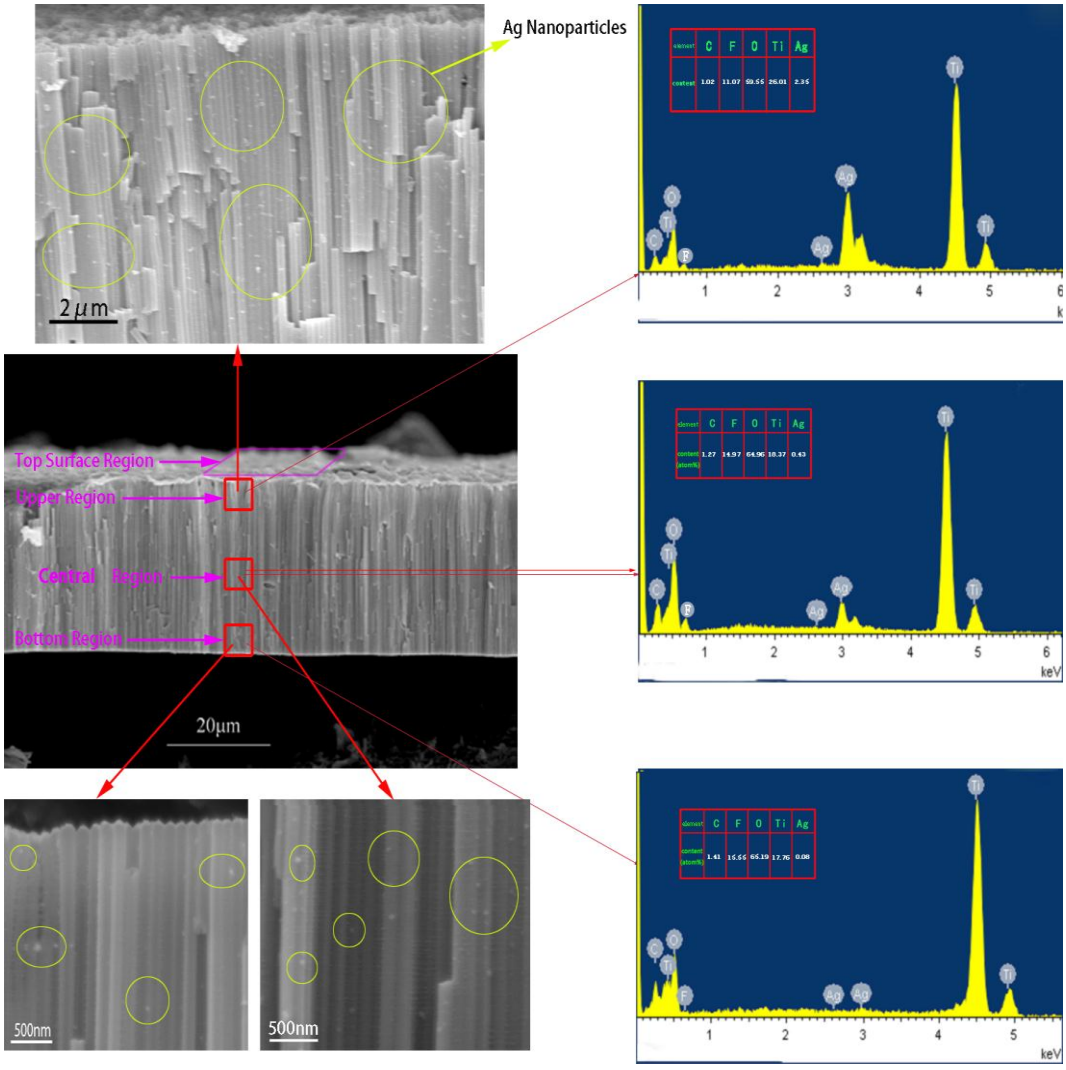


Figure S2. SEM images of the distribution of Ag NPs in the different regions of c-TNTAs (the central and bottom region only show sporadic Ag NPs), the right part showing the corresponding EDX results of the different regions.

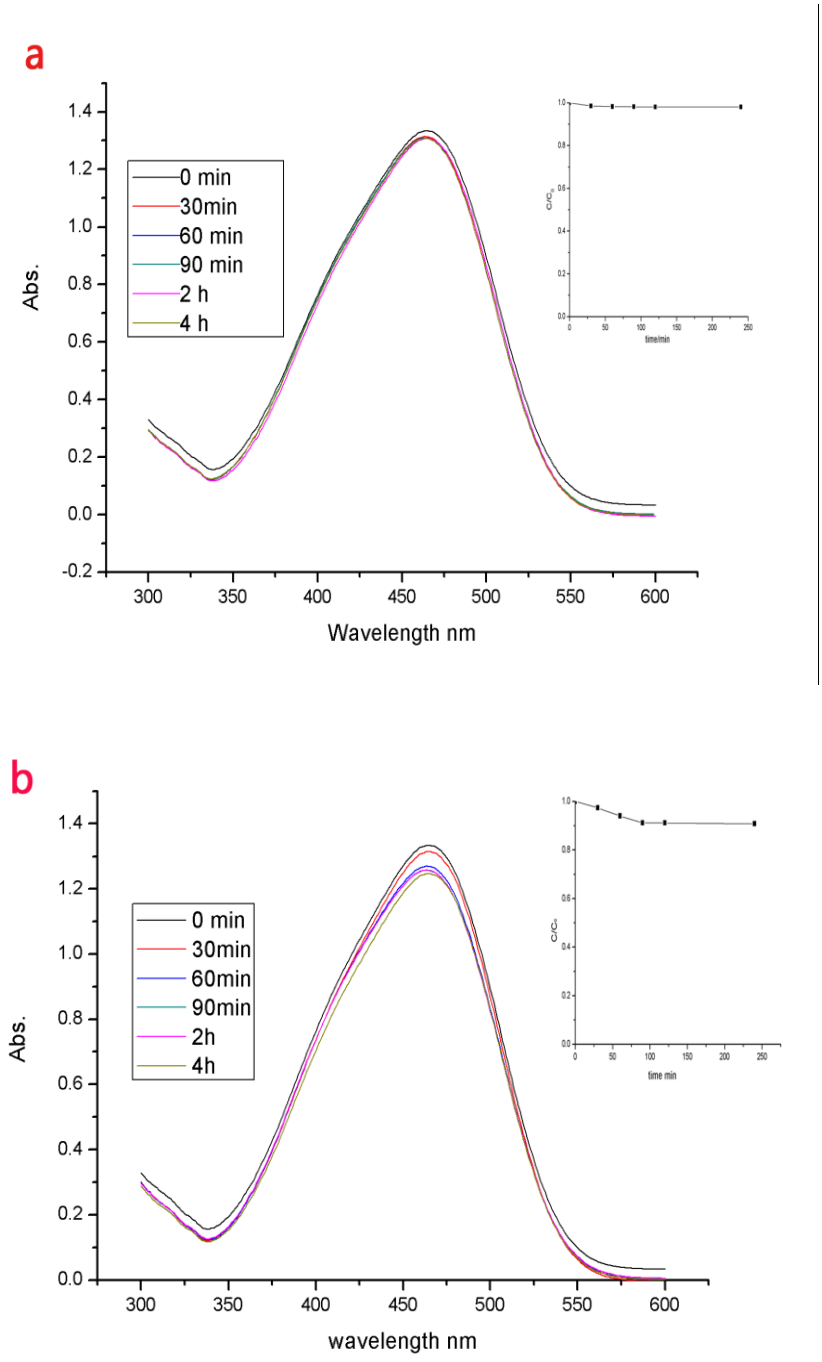


Figure S3. The absorption spectra of c-TNTA (a) and f-TNTA (b) in dark at room temperature. The insert pictures are the corresponding concentration change of MO. It obviously shows the absorption property of f-TNTA is much better than that of c-TNTA. This is due to the flowability of f-TNTA and allows more active sites to absorb dye. While for c-TNTA, the nanotube is sealed at one end, inhibits the dye to fully wet the nanotubes and causes a low absorption of dye.

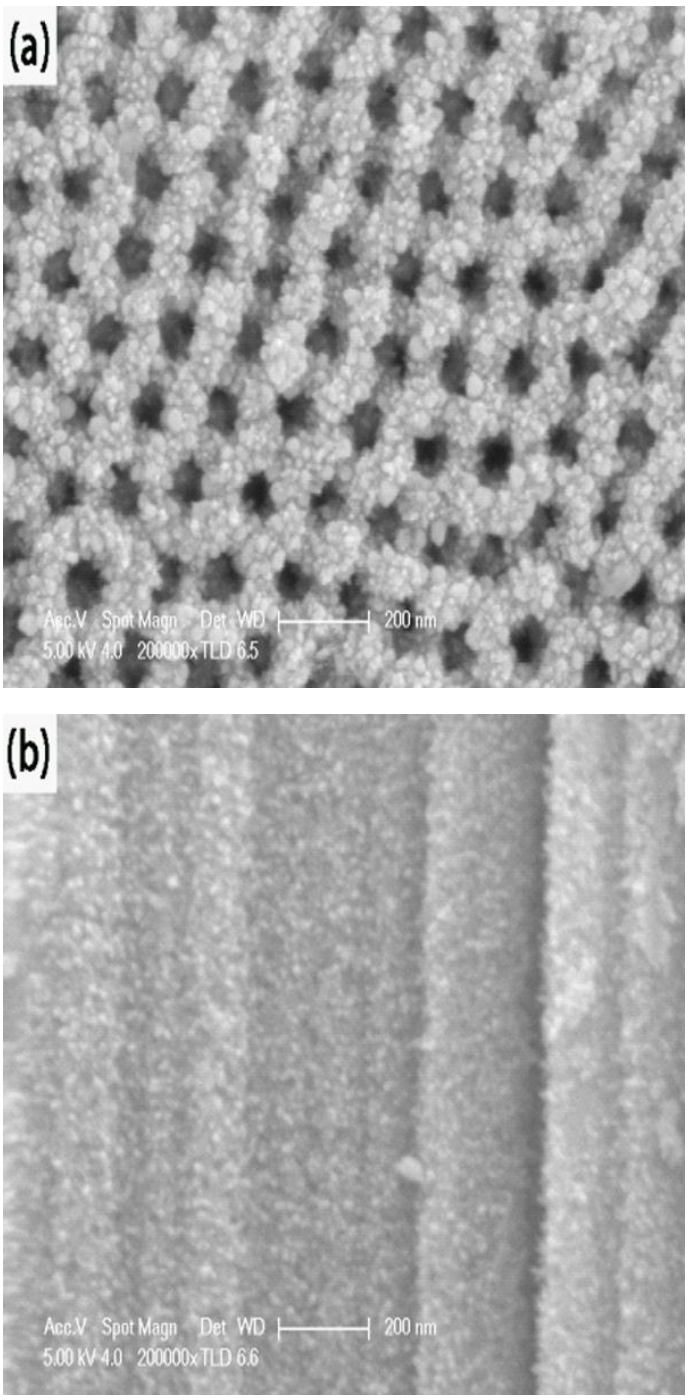
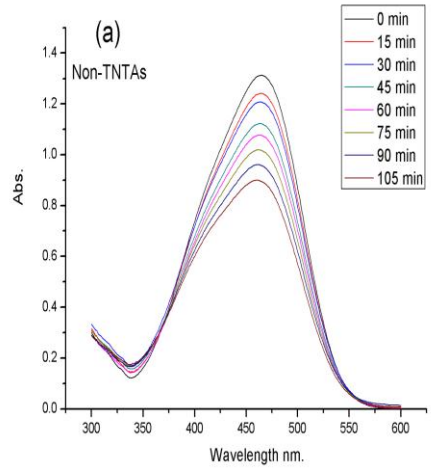
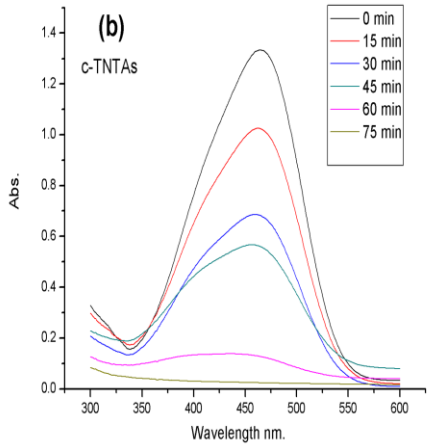
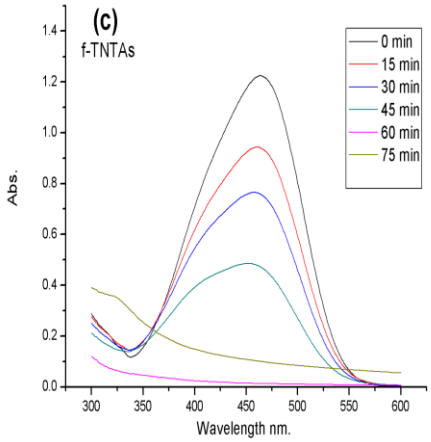
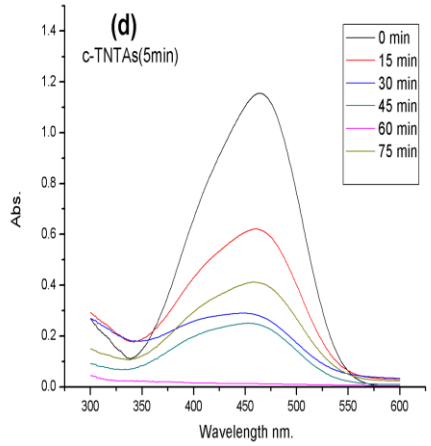


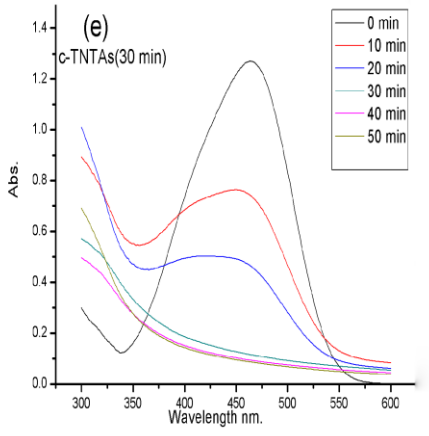
Figure S4. The top surface (a) and cross-sectional (b) SEM images of Ag NPs decorated f-TNTAs (f-TNTAs were immersed in $AgNO_3$ for 1 h). The Ag NPs get coarsen and aggregated on the top surface of TNTAs.

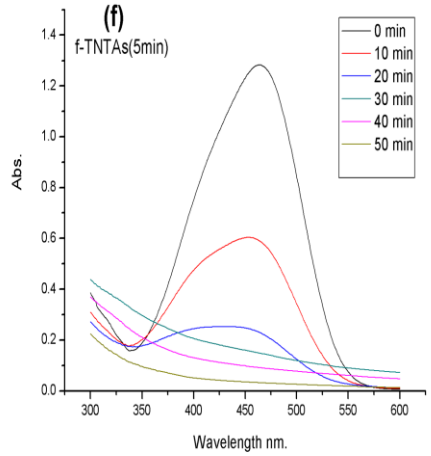












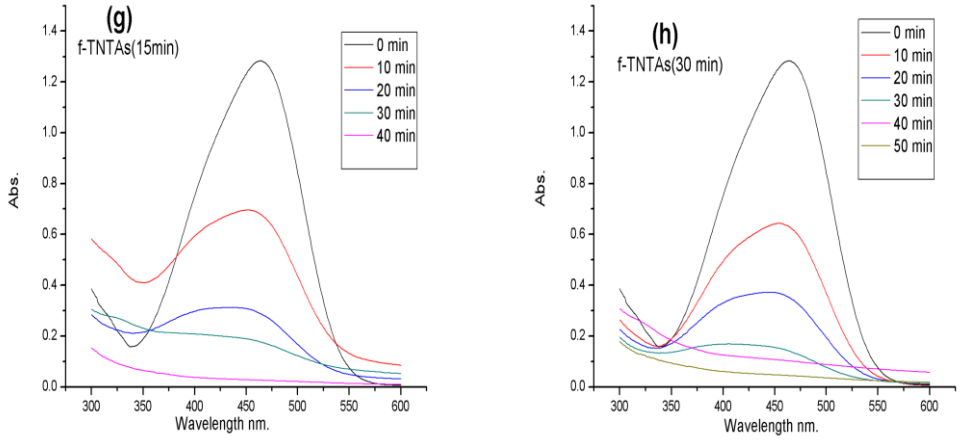


Figure S5. Absorption spectra of MO during the photodegradation process over various photocatalysts under UV light. (a): a blank experiment where no catalysts in used; (b) and (c): bare c-TNTAs and f-TNTAs are used as reference catalyst; (d) and (e) are c-TNTAs catalysts with immersed in $AgNO_3$ for 5 min and 30 min, respectively; (f) , (g) and (h) are f-TNTAs catalysts with immersed in $AgNO_3$ for 5 min ,15min and 30 min, respectively.

Table S1. The silver content of different regions of annealed Ag-NPs/TNTAs samples from the EDX results.

Sample No.	Impregnation time(min)	The top surface region	The upper region	The intermediate region	The bottom region
1	5	1.42 at.%	0.87 at.%	0.53 at.%	0.45 at.%
2	15	2.6 at.%	1.76 at.%	1.02 at.%	1.37 at.%
3	30	3.2 a t.%	2.21 at.%	1.41 at.%	1.23 at.%
4	60	5.03 at.%	3.29 at.%	3.39 at.%	1.45 at.%
5	5	0.99 at.%	0.53 at.%	0.38 at.%	0.04 at.%
6	30	2.78 at.%	2.35 at.%	0.43 at.%	0.08 at.%