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Supporting Information

Diffusion Kinetics of Gold in TiO_2 Nanotube Arrays for formation of Au@TiO_2 Nanotube Arrays

Wanggang Zhang [1,2,3], Yiming Liu [1,2], Diaoyu Zhou[1,2], Jing Wen[1,2], Liuwei Zheng[1,2], Wei Liang[1,2,*] and Fuqian Yang[3,*]

[1] College of Materials Science and Engineering, Taiyuan University of Technology, Taiyuan Shanxi 030024, China

[2] Key Laboratory of Interface Science and Engineering in Advanced Materials, Taiyuan University of Technology, Ministry of Education, Taiyuan Shanxi 030024, China

[3] Department of Chemical and Materials Engineering, University of Kentucky, Lexington, KY 40506, USA

Figure S1 shows SEM images of pure TiO_2 nanotubes arrays prepared by the one-step anodization process and the two-step anodization process, and SEM image of the imprints left on the surface of the Ti sheet after ultrasonication.

Figure S2 shows the EDS analyses of the bottom and upper sides of the Au@TiO_2 nanotubes arrays after heat treatment at 450 ºC for 3 hr.

Figure S3 shows SEM images of the bottom side of Au@TiO_2 nanotubes arrays with heat treatment at both 450 and 500 ºC for 5 hr.

Figure S4 shows TEM images of Au@TiO_2 nanotubes arrays after heat treatment at 500 ºC for three different heating times and the corresponding size distribution of Au nanocrystals.

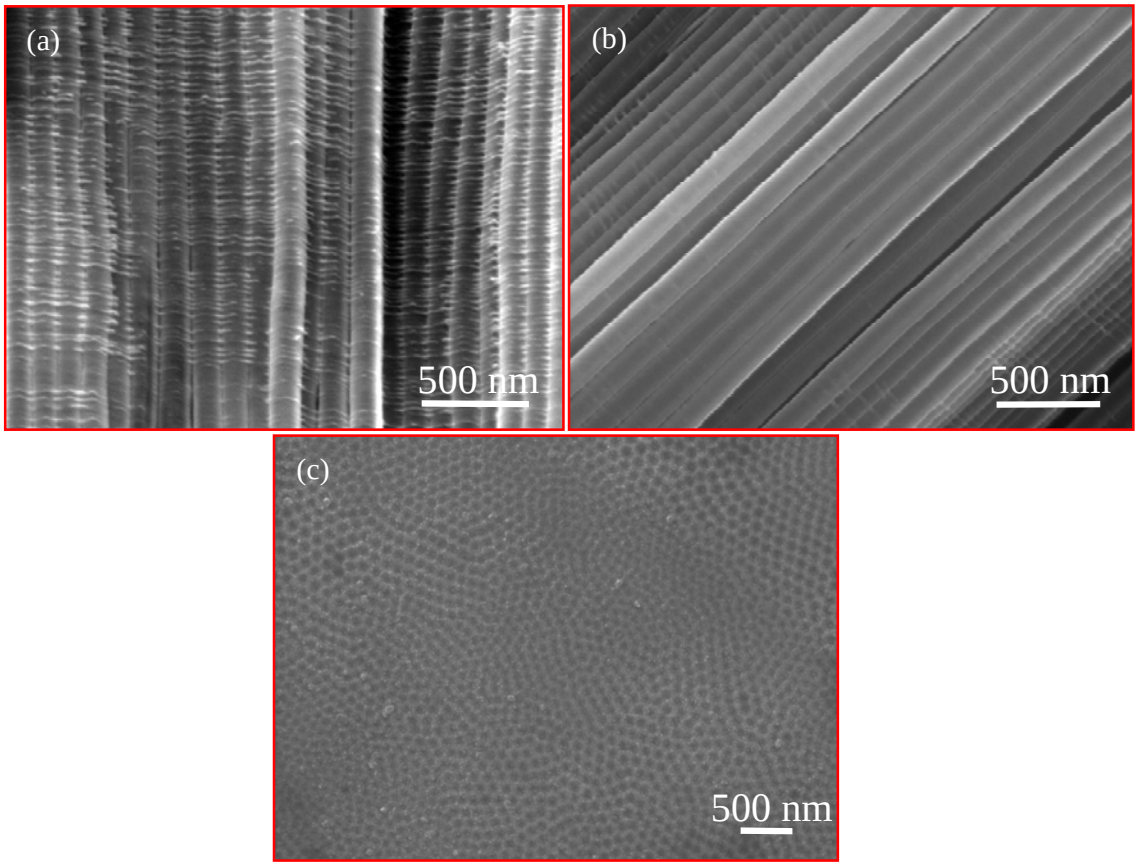
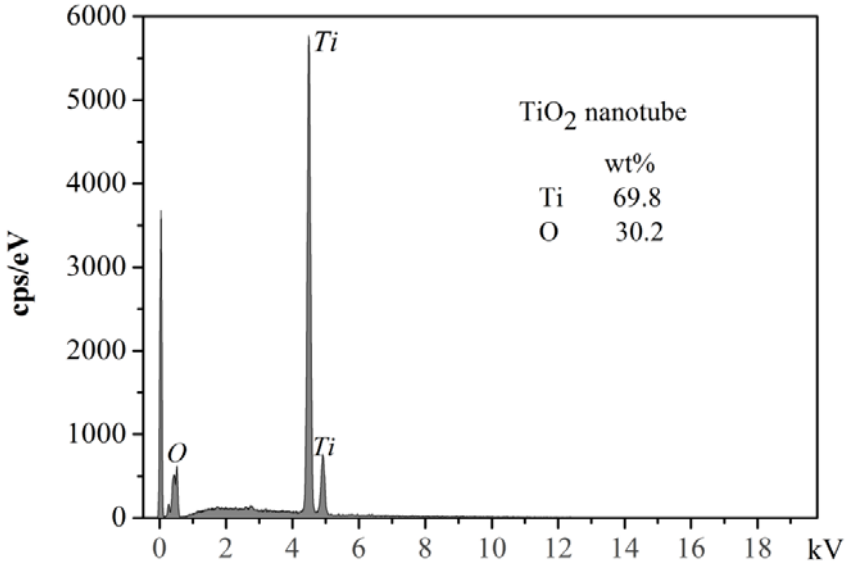
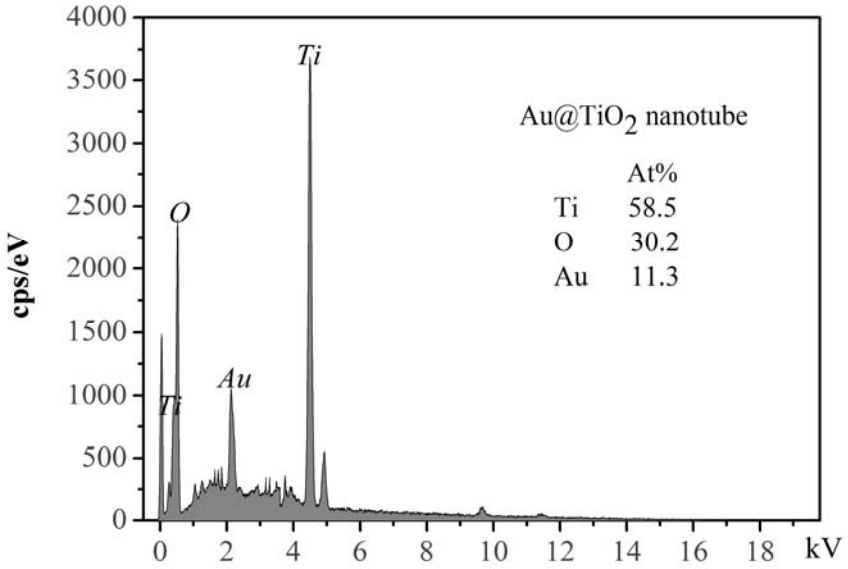


Figure S1. SEM images of pure TiO_2 nanotubes arrays; (A) TiO_2 nanotubes arrays prepared by the one-step anodization process, (b) TiO_2 nanotubes arrays prepared by the two-step anodization process, and (3) SEM image of the imprints left on the surface of the Ti sheet after ultrasonication



(a)



(b)

Figure S2. EDS analysis of Au@TiO_2 nanotubes arrays after heat treatment at 450 ºC for 3 hr; (a) bottom side and (b) upper side

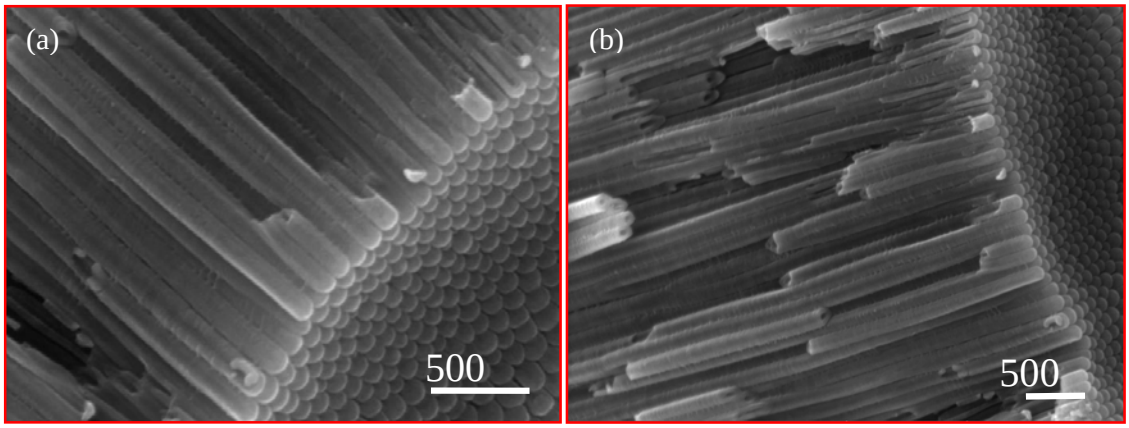


Figure S3. SEM images of the bottom side of Au@TiO_2 nanotubes arrays (a) with heat treatment at 450 ºC for 5 hr and (b) with heat treatment at 500 ºC for 5 hr

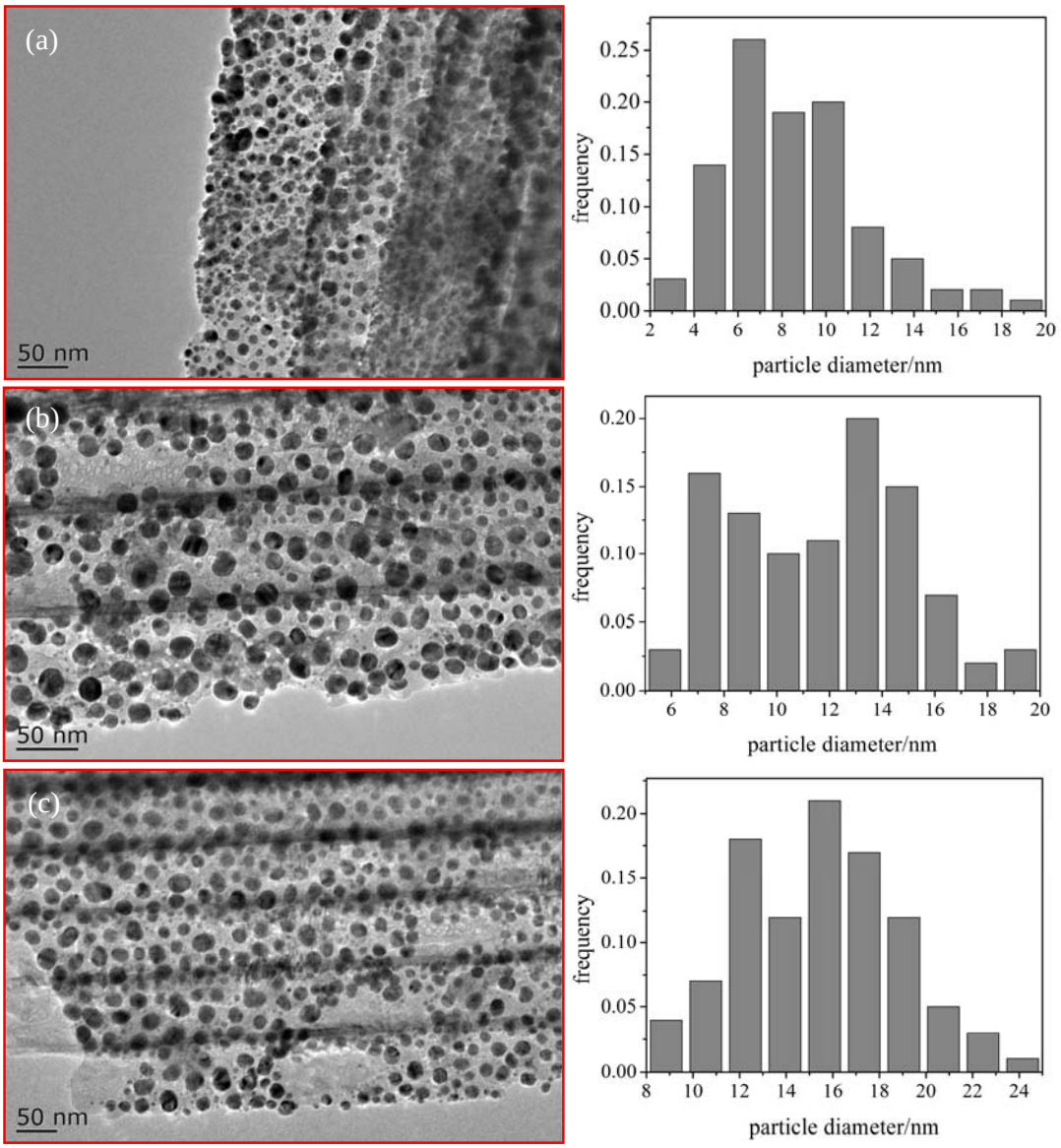


Figure S4. TEM images of Au@TiO_2 nanotubes arrays after heat treatment at 500 ^oC for three different times and the corresponding size distribution of Au nanocrystals; (a) 1 hr (average size: 8.55 nm), (b) 3 hr (average size: 11.68 nm); (c) 5 hr (average size: 15.53 nm)

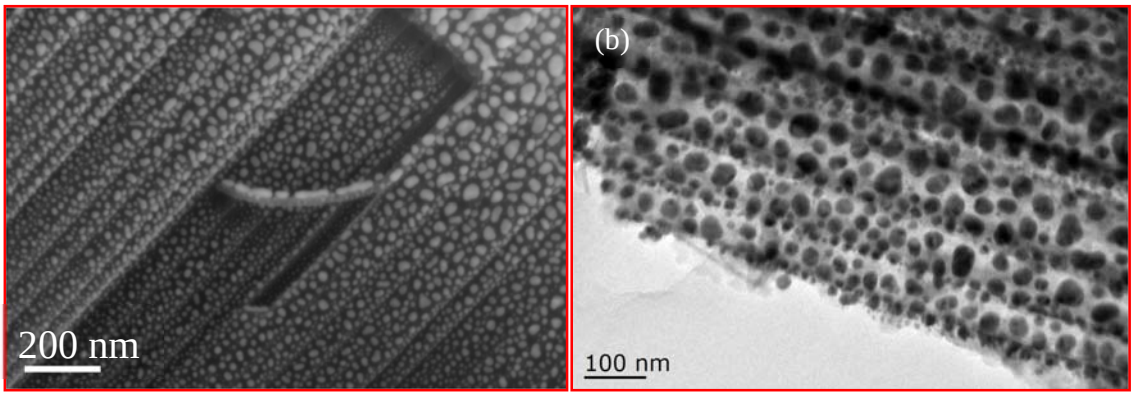


Figure S5 (a) SEM image of $Au@TiO_2$ nanotubes arrays after heat treatment at 450 ºC for 3 hr in argon environment, and (b) TEM image of $Au@TiO_2$ nanotubes arrays after heat treatment at 450 ºC for 3 hr in argon environment