

Article

# Enhanced Surface Plasmon by Clusters in TiO<sub>2</sub>-Ag Composite

Yongjun Zhang <sup>1</sup>, Zhen Xu <sup>1</sup>, Shengjun Wu <sup>2\*</sup>, Aonan Zhu <sup>3</sup>, Xiaoyu Zhao <sup>1</sup> and Yaxin Wang <sup>1,\*</sup>

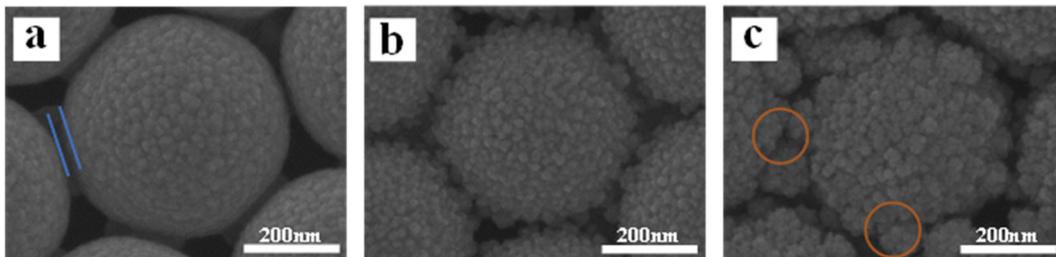
<sup>1</sup> School of Material and Environmental Engineering, Hangzhou Dianzi University, Hangzhou 310018, People's Republic of China

<sup>2</sup> Department of Clinical Laboratories, Sir Run Run Shaw Hospital, School of Medicine, Zhejiang University, Hangzhou 310020, People's Republic of China

<sup>3</sup> College of Chemistry, Nankai University, Tianjin 300071, People's Republic of China

\* Correspondence: 3202107@zju.edu.cn (S.W.); yaxinwang@hdu.edu.cn (Y.W.)

## Supplementary information



**Figure S1.** (a–c) SEM images for the samples with TiO<sub>2</sub> sputtering power 20 W, 40 W and 60 W respectively and Ag sputtering power of remains unchanged.

**Citation:** Zhang, Y.; Xu, Z.; Wu, S.; Zhu, A.; Zhao, X.; Wang, Y. Enhanced Surface Plasmon by Clusters in TiO<sub>2</sub>-Ag Composite. *Materials* **2022**, *15*, 7519. <https://doi.org/10.3390/ma15217519>

Academic Editor: Sergio Morales-Torres

Received: 13 September 2022

Accepted: 24 October 2022

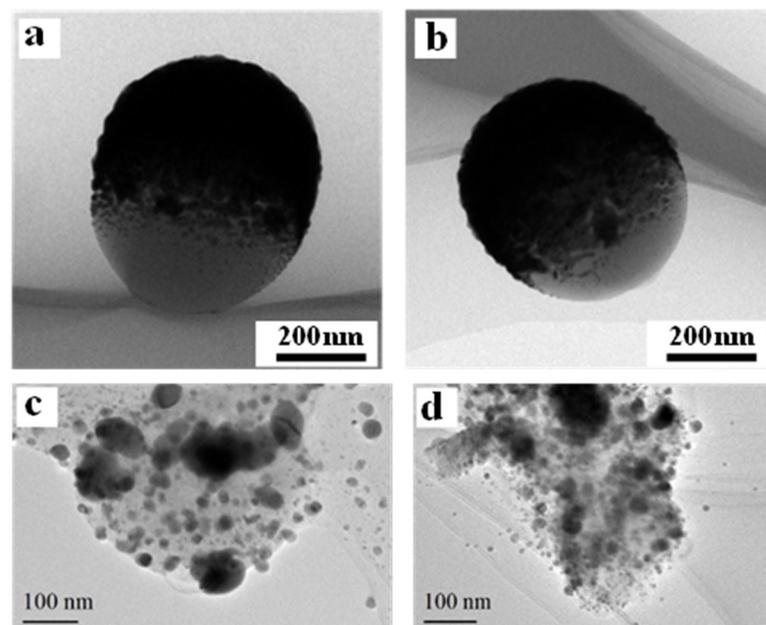
Published: 26 October 2022

**Publisher's Note:** MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Copyright:** © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

SEM images confirms the low concentration of TiO<sub>2</sub> addition has little effect on Ag nanocaps into some and Ag nanoparticles are still compact under SEM observations. More TiO<sub>2</sub> addition leads to the coarse surface and finally results in the cluster decorated TiO<sub>2</sub>-Ag nanocaps.



**Figure S2.** (a) TEM image for Ag nanocaps; (b–d) TEM images for the samples with TiO<sub>2</sub> sputtering power 20W, 40W and 60W respectively.

TEM observations show the nanoparticles of Ag nanocaps are still compact under as shown in Figure S2a. The low concentration of TiO<sub>2</sub> addition, for example, sputtering power 20W, shows little effects on Ag nanocaps, which is quite similar to Ag nanocaps, as shown in Figure S2b. More TiO<sub>2</sub> addition results in smaller Ag nanoparticles, for example, the sputtering power 40W results in Ag nanoparticles with the size around 25nm as shown in Figure S2c, and the sputtering power 60W results in Ag nanoparticles with the size around 15nm, as shown in Figure S2d.