

This is an Open Access document downloaded from ORCA, Cardiff University's institutional repository: <https://orca.cardiff.ac.uk/id/eprint/130395/>

This is the author's version of a work that was submitted to / accepted for publication.

Citation for final published version:

Caswell, Thomas, Dlamini, Mbongiseni W., Miedziak, Peter J., Pattisson, Samuel, Davies, Philip R. , Taylor, Stuart H. and Hutchings, Graham J. 2020. Enhancement in the rate of nitrate degradation on Au- and Ag-decorated TiO₂ photocatalysts. *Catalysis Science and Technology* 10 (7) , pp. 2083-2091. 10.1039/C9CY02473E

Publishers page: <http://dx.doi.org/10.1039/C9CY02473E>

Please note:

Changes made as a result of publishing processes such as copy-editing, formatting and page numbers may not be reflected in this version. For the definitive version of this publication, please refer to the published source. You are advised to consult the publisher's version if you wish to cite this paper.

This version is being made available in accordance with publisher policies. See <http://orca.cf.ac.uk/policies.html> for usage policies. Copyright and moral rights for publications made available in ORCA are retained by the copyright holders.



Enhancement in the rate of nitrate degradation on Au- and Ag-decorated TiO₂ photocatalysts

Thomas Caswell,^a Mbongiseni W. Dlamini,^a Peter J. Miedziak,^{a,b} Samuel Pattison,^a
Philip R. Davies,^a Stuart H. Taylor,^a Graham J. Hutchings^{a*}

^aCardiff Catalysis Institute, School of Chemistry, Cardiff University, Park Place, Cardiff, CF10 3AT, UK

^bSchool of Applied Sciences, University of South Wales, Pontypridd CF37 4AT, UK

*Corresponding author: hutch@cardiff.ac.uk (GJ Hutchings)

Photocatalyst	Period after agitation (min)	Average aggregate diameter (nm)
P25 TiO ₂	0	6008
	120	3451
0.3%Au/TiO ₂	0	3813
	120	1021

Table S1: Dynamic light scattering (DLS) analysis of a suspension of 10 mg catalyst in 10 ml H₂O.

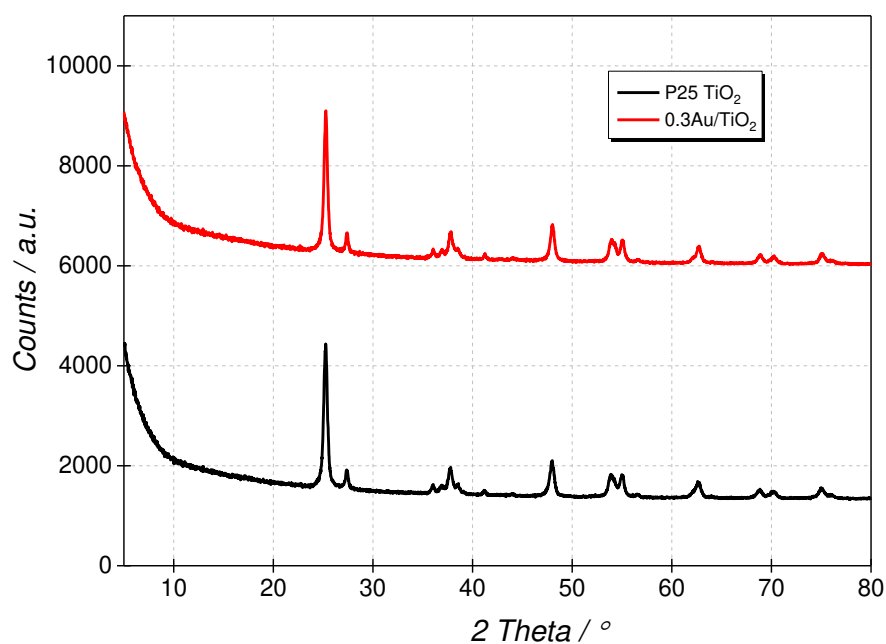


Fig. S1: *Ex situ* XRD patterns of the P25 TiO₂ support material (black line) and 1%Au/TiO₂ photocatalyst (red line).

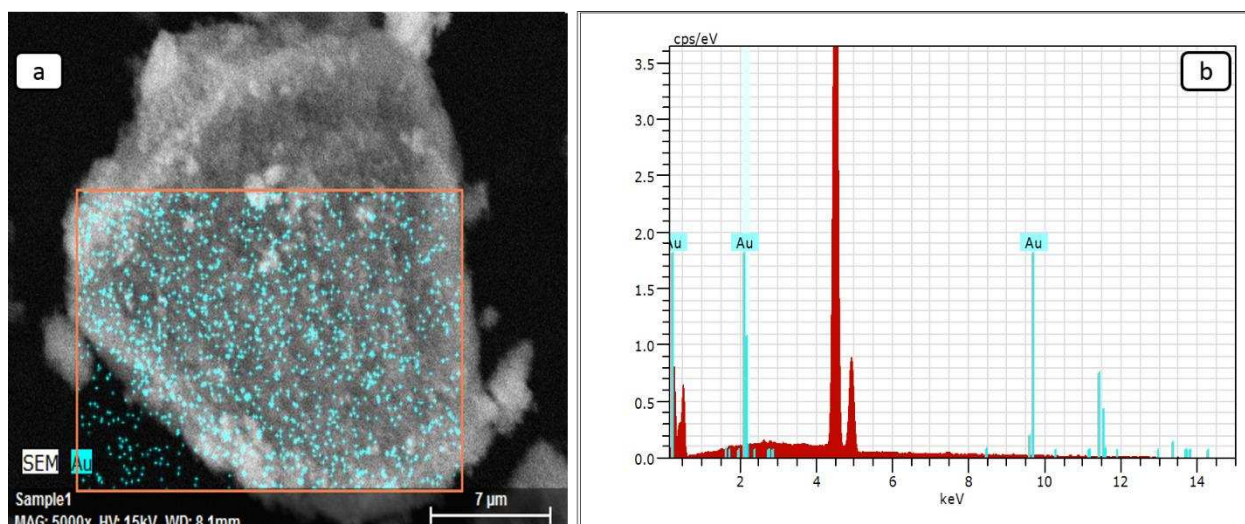


Fig. S2: (a) SEM-EDX elemental mapping and (b) the corresponding EDX spectrum of the 1%Au/TiO₂ catalyst.

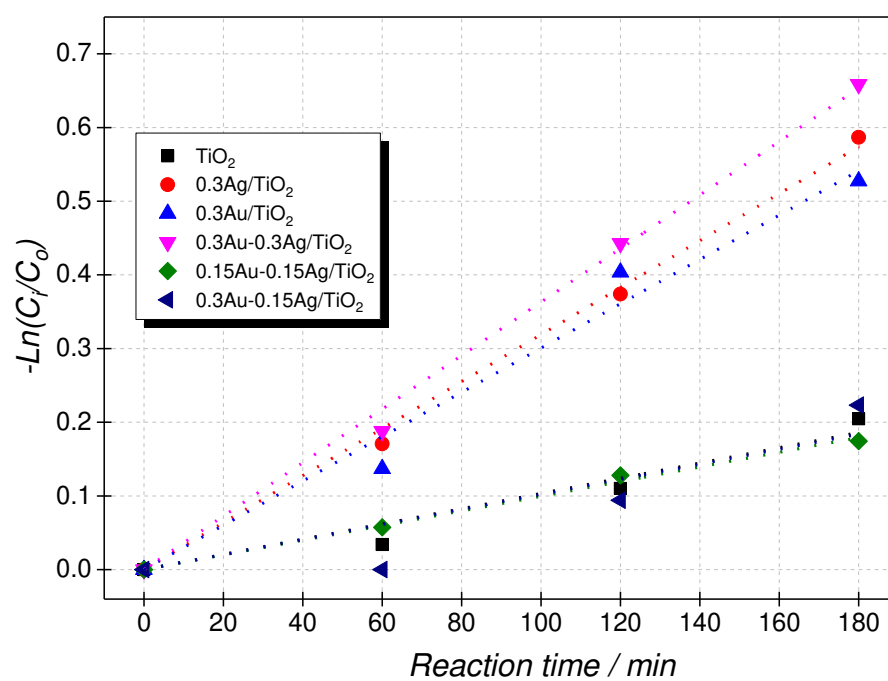


Fig. S3: Pseudo first order kinetics plot for the photocatalytic nitrate degradation on mono- and bimetallic samples.