

# Supporting information

## Electrostatic-driven gelation of colloidal nanocrystals

*Taisiia Berestok,<sup>†,‡</sup> Pablo Guardia,<sup>†,\*</sup> Maria Ibáñez,<sup>⊥</sup> Michaela Meyns,<sup>†</sup> Massimo Colombo,<sup>¶</sup> Maksym V. Kovalenko,<sup>⊥,§</sup> Francesca Peiró<sup>‡,||</sup> and Andreu Cabot<sup>†,¶,\*</sup>*

<sup>†</sup> Catalonia Institute for Energy Research – IREC, 08930 Sant Adrià de Besòs, Barcelona, Spain

<sup>‡</sup> LENS-MIND, Departament d'Enginyeria Electrònica I Biomèdica, Universitat de Barcelona, 08028, Barcelona, Spain

<sup>⊥</sup> Institute of Inorganic Chemistry, Department of Chemistry and Applied Biosciences, ETH Zürich, CH-8093, Switzerland

<sup>¶</sup> Nanochemistry Department, Istituto Italiano di Tecnologia, via Morego 30, 16130 Genova, Italy

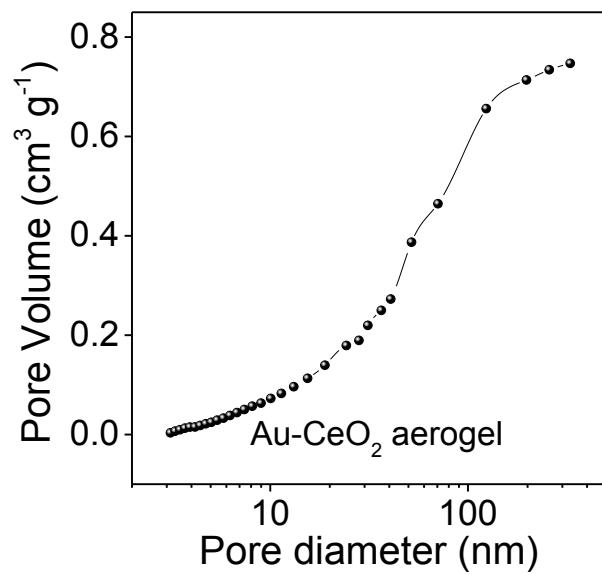
<sup>§</sup> EMPA-Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, CH-8600, Switzerland

<sup>||</sup> Institute of Nanoscience and Nanotechnology (In2UB), Universitat de Barcelona, 08028, Barcelona, Spain

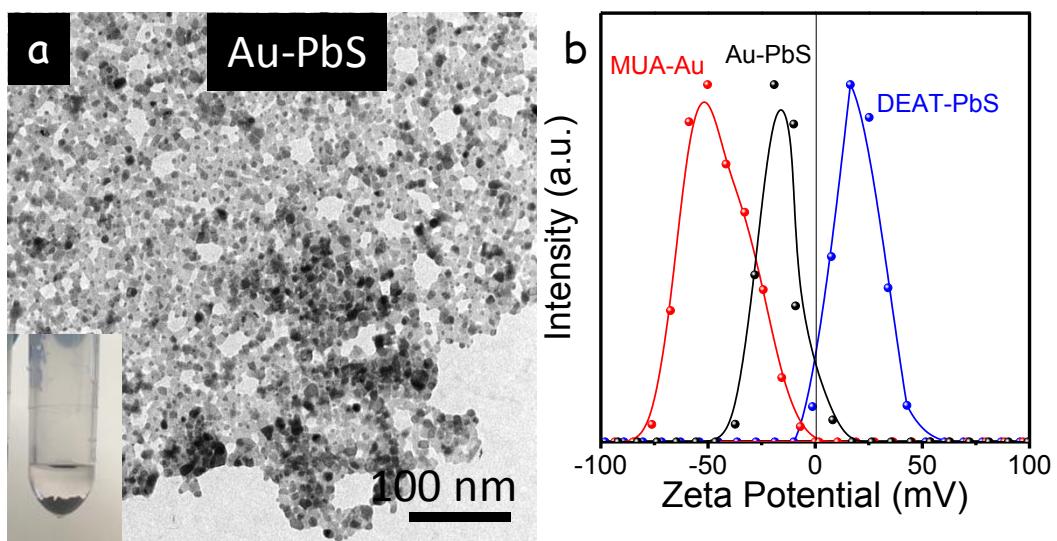
<sup>¶</sup> ICREA, Pg. Lluís Companys 23, 08010 Barcelona, Spain.

### **Table of contents**

Figure S1. BJH Pore size distribution	S2
Figure S2. Additional TEM and Z-potential	S3
Table S1. Comparison of catalytic activity	S4



**Figure S1.** BJH Pore size distribution of an Au-CeO<sub>2</sub> aerogel.



**Figure S2.** a) TEM image of the Au-PbS NCs gel obtained by mixing 100  $\mu$ L of a 5 mg/mL MFA solution of DEAT-PbS NCs with 100  $\mu$ L of a 5 mg/mL MFA solution of MUA-Au NCs. b) Zeta potential curves of the gel formed after mixing of NCs.

**Table S1:** Comparison of the catalytic activity of Au-CeO<sub>2</sub> aerogels against similar Au@CeO<sub>2</sub> systems catalysts reported in literature.

	Au loading (%wt)	T (°C)	CO / O <sub>2</sub> (v% / v%)	Specific Rate (mmol <sub>CO</sub> /g <sub>Au</sub> /s)	Source
Au-CeO <sub>2</sub> aerogels	13	50	1/10	0.0015	This work
Au@CeO <sub>2</sub>	27.6	40	1/20	0.008	Liu et al. <sup>1</sup>
Au@h-CeO <sub>2</sub> /SiO <sub>2</sub>	0.74	40	1/6	0.151	Wu et al. <sup>2</sup>
Au@CeO <sub>2</sub>	0.39	50	1.96/21	0.084	He et al. <sup>3</sup>
Au/CeO <sub>2</sub>	2.68	75	1/10	0.006	Wang et al. <sup>4</sup>

## REFERENCES

- (1) Liu, D.; Li, W.; Feng, X.; Zhang, Y. Galvanic replacement synthesis of Ag<sub>x</sub>Au<sub>1-x</sub>@CeO<sub>2</sub> (0≤x≤1) core@shell nanospheres with greatly enhanced catalytic performance. *Chem. Sci.* **2015**, *6* (12), 7015-7019.
- (2) Wu, C.; Dang, Z.; Prato, M.; Marras, S.; Cerea, A.; De Angelis, F.; Manna, L.; Colombo, M. Nanosized, Hollow, and Mn-Doped CeO<sub>2</sub>/SiO<sub>2</sub> Catalysts via Galvanic Replacement: Preparation, Characterization, and Application as Highly Active Catalysts. *ACS Appl. Nano Mater.* **2018**, *1* (4), 1438-1443.
- (3) He, B.; Zhao, Q.; Zeng, Z.; Wang, X.; Han, S. Effect of hydrothermal reaction time and calcination temperature on properties of Au@CeO<sub>2</sub> core–shell catalyst for CO oxidation at low temperature. *J. Mater. Sci.* **2015**, *50* (19), 6339-6348.
- (4) Wang, F.; Xu, L.; Zhang, J.; Zhao, Y.; Li, H.; Li, H. X.; Wu, K.; Xu, G. Q.; Chen, W., Tuning the metal-support interaction in catalysts for highly efficient methane dry reforming reaction. *Appl. Catal. B.* **2016**, *180*, 511-520.