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A new preparation strategy via in-situ catalytic process: CeO_2@Ag/$Ag_2Ta_4O_{11}$ catalyst toward 4-nitrophenol reduction

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IS: Fig. S1

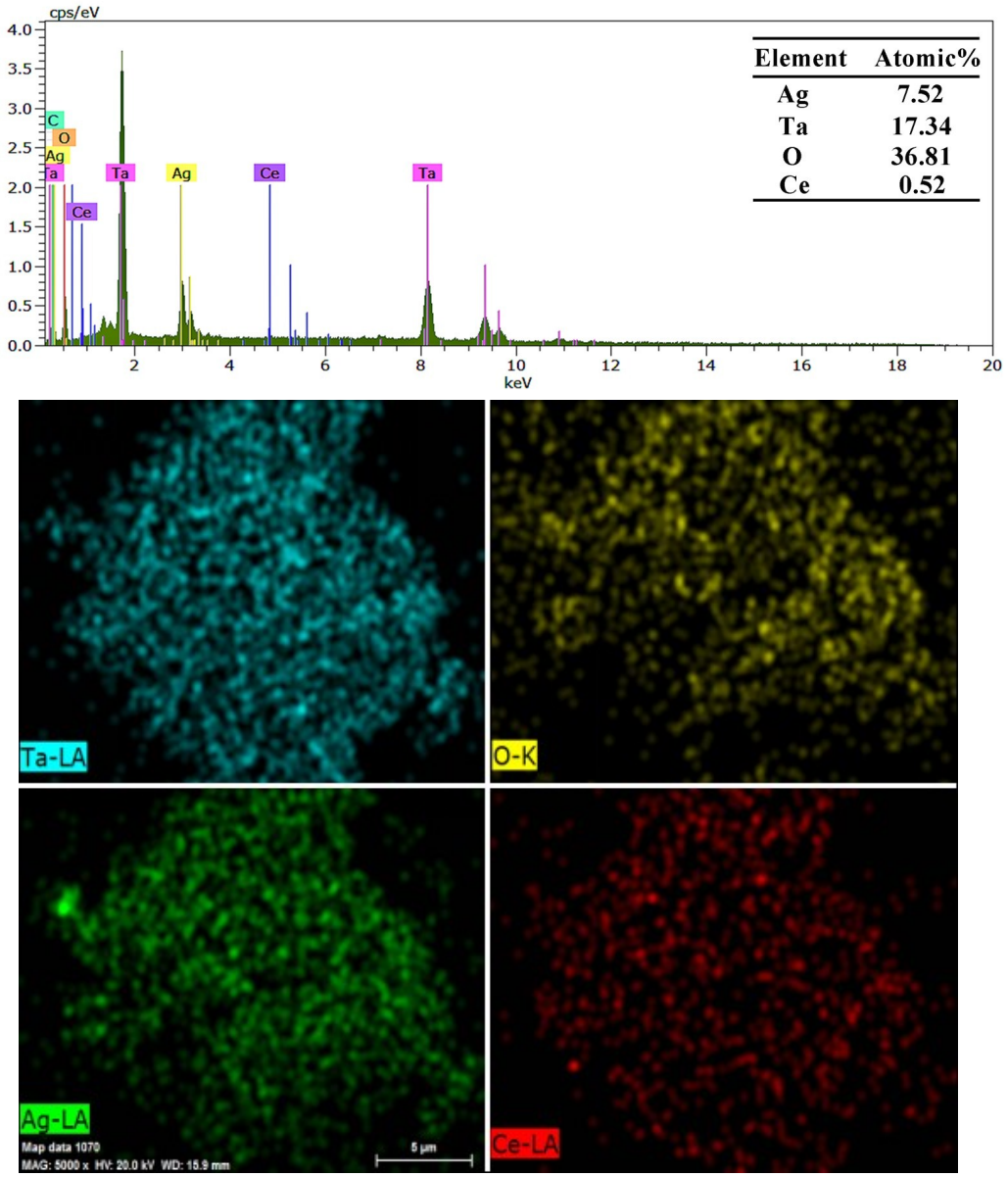

Figure S1 The energy-dispersive X-ray spectrum and map scanning of 0.2CeO_2@$Ag_2Ta_4O_{11}$ nanocomposite.

IS: Fig. S2

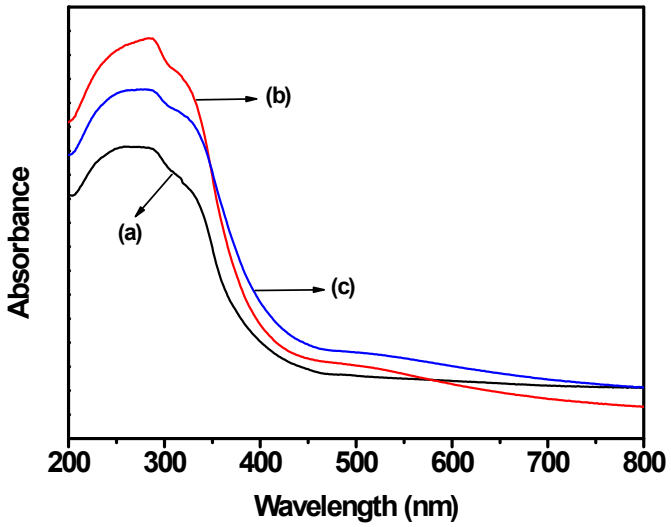

Fig. S2 UV–Vis diffuse reflectance spectra of CeO_2@$Ag_2Ta_4O_{11}$ with different molar ratio: (a) 0.1CeO_2@$Ag_2Ta_4O_{11}$, (b) 0.2CeO_2@$Ag_2Ta_4O_{11}$, (c) 0.3CeO_2@$Ag_2Ta_4O_{11}$

IS: Fig. S3

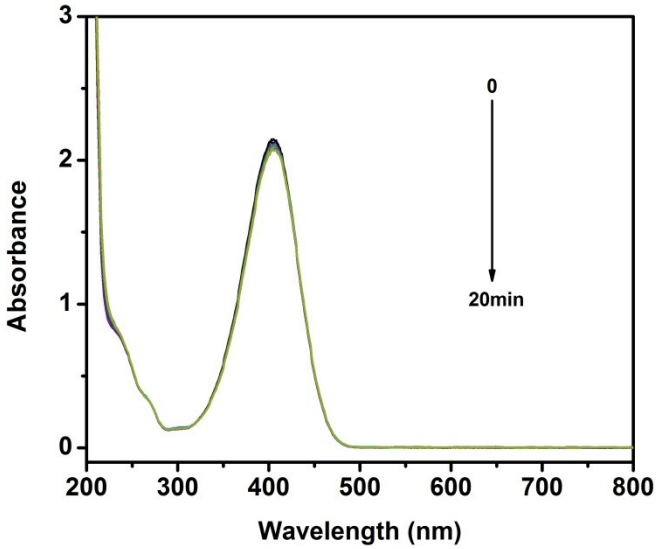

Fig. S3 UV-vis absorption spectra for the catalytic reduction of 4-NP without catalyst

IS: Fig. S4

Fig. S4 The colour of the catalysts before and after the reduced reaction

Table. S1 Reaction rate constant of $CeO_2@Ag_2Ta_4O_{11}$ nanoparticles together with several catalysts reported in literatures

Number	Catalysts	$k_{app}(\times10^{-2})$ min^{-1}	Activity factor ($k/min^{-1}\cdot mg^{-1}$ of active metal)	Literature
1	$0.1CeO_2@Ag_2Ta_4O_{11}$	64.996	129.99	This work
2	$0.2CeO_2@Ag_2Ta_4O_{11}$	143.768	287.54	This work
3	$0.3CeO_2@Ag_2Ta_4O_{11}$	306.866	613.73	This work
4	Ag NPs@PGMA-SH composite	23.64±1.98	47.28±3.96	1
5	graphene oxide/Ag NPs−Fe_3O_4	160.2	320.4	2
6	Ag/SiO_2 1.08	16.38	32.76	3
7	Ag NPs on nanostructured silica	6.48	12.96	4
8	Ag NPs on Fe_3O_4@C nanocomposites	102	204	5
9	micron-SiO_2@Ag NPs	21.36	42.72	6
10	Ag/TiO_2 nanoparticles	194.85	389.7	7

IS: Fig. S5

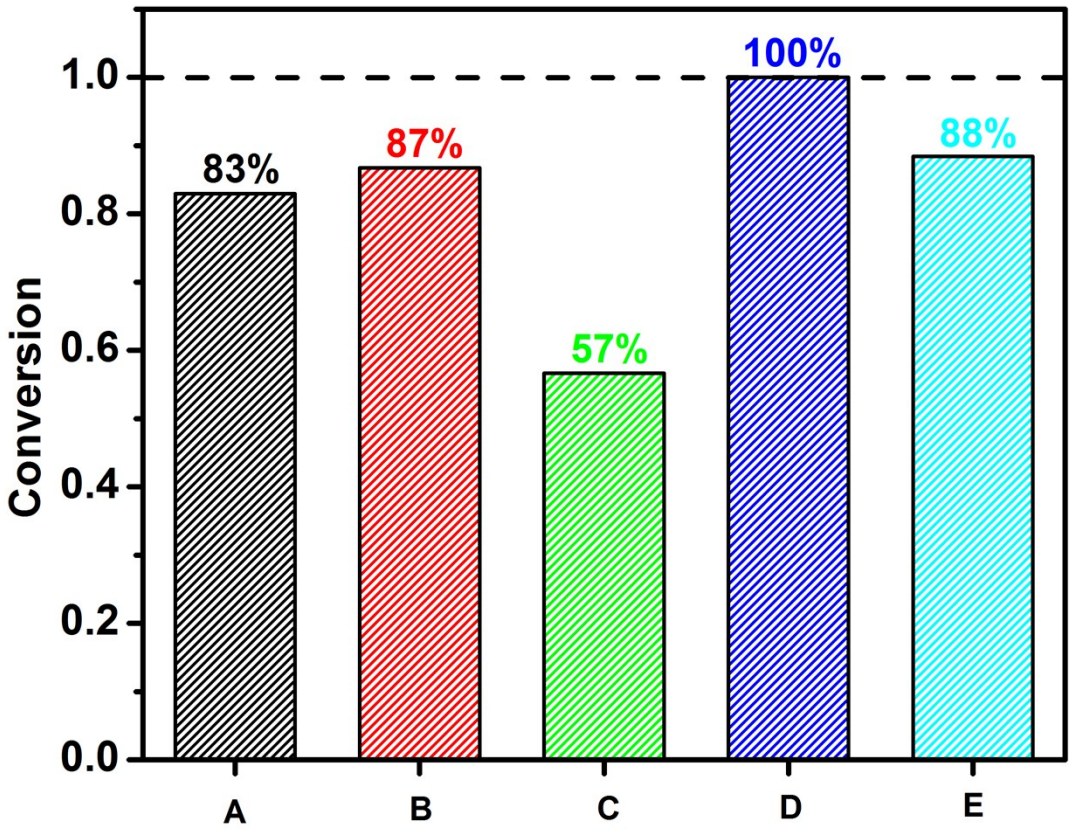

Fig. S5 profile of conversion efficiency vs time during the catalytic reduction of (A) 4-chloronitrobenzene, (B) 4-nitrobenzoic acid, (C) p-nitrotoluene, (D) nitrobenzene and (E) 4-nitrophenol over $0.2CeO_2@Ag_2Ta_4O_{11}$ in a reactive time of 3 min.

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