Electronic Supplementary Material (ESI) for RSC Advances.

Highly efficient and economical Ag heterogeneous catalyst and cooperative effect of trace ammonia

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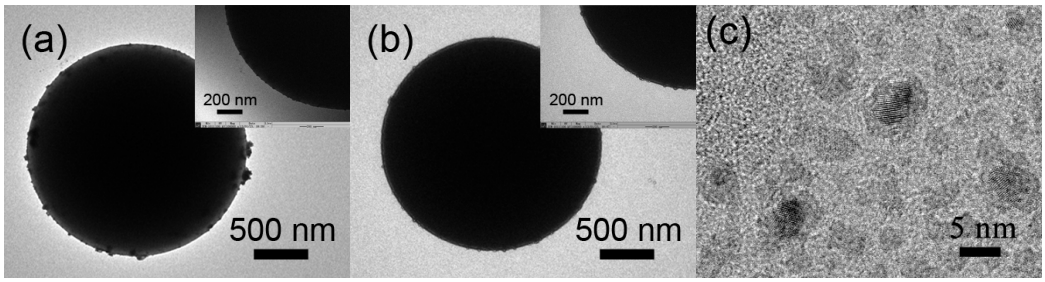

Figure S1. TEM images of PS/AgNP2 (a), PS/*m*AgNP2-10 (b), whose inserts show their highermagnification images; HRTEM of *m*AgNP2-10 (c).

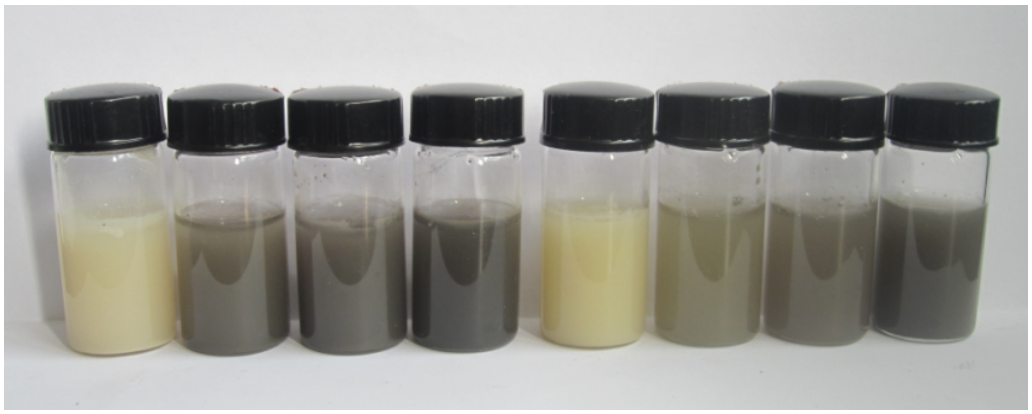

Figure S2. Photos of the resultant colloids:PS/AgNP1, PS/*m*AgNP1-2, PS/*m*AgNP1-10, PS/*m*AgNP1-20, PS/AgNP2, PS/*m*AgNP2-2, PS/*m*AgNP2-10, PS/*m*AgNP2-20,from left,in turn.

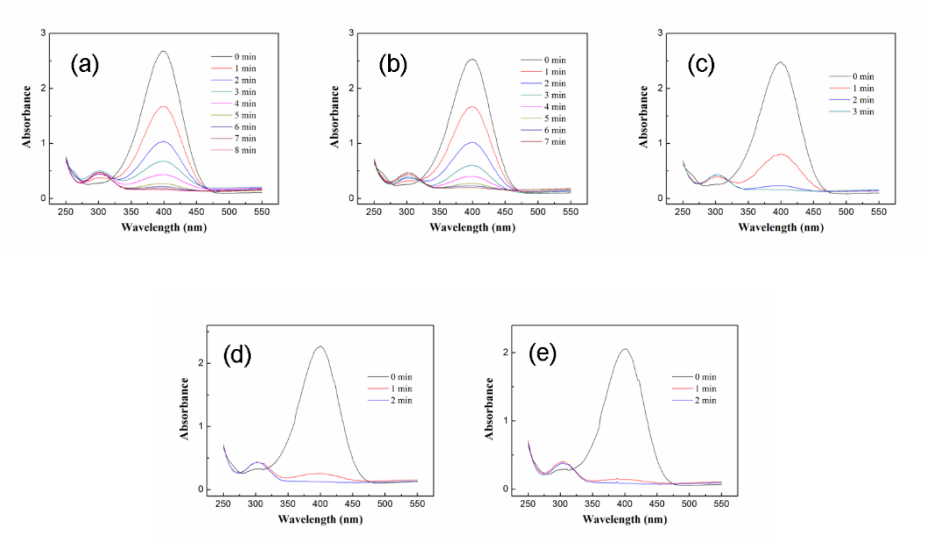

Figure S3.UV-visible absorption spectra of 4-NP during the reduction catalyzed byPS/*m*AgNP2-2, [M]=1.0×10^{-5} mol/L with NH_3 concentration 0 (a), 0.002 (b), 0.005 (c), 0.01 (d) and 0.02% (e).

Table S1. The TGA data of PS/Ag@AgAu composite particles

Samples	***W*(M)**
PS/AgNP1	**5.8%**
PS/*m*AgNP1-2	**13.2%**
PS/*m*AgNP1-10	**15.4%**
PS/*m*AgNP1-20	**14.5%**
PS/AgNP2	**1.4%**
PS/*m*AgNP2-2	**7.3%**
PS/*m*AgNP2-10	**8.6%**
PS/*m*AgNP2-20	**10.5%**

Table S2. The statistics of each sample in catalytic reduction of 4-NP

Samples	***C*** **(g/L)**	**[M] (mM)**	***k*** **[a]** **(s^{-1})**	***k'*** **[b]** **(s^{-1})**	***k*****/[M]** **($L\cdot mmol^{-1}\cdot s^{-1}$)**	***k'*****/[M]** **($L\cdot mmol^{-1}\cdot s^{-1}$)**
PS/AgNP1	0.167	0.090	2.1×10^{-3}	1.6×10^{-2}	2.3×10^{-2}	1.8×10^{-1}
PS/*m*AgNP1-2	0.050	0.0592	7.7×10^{-3}	1.4×10^{-2}	1.3×10^{-1}	2.4×10^{-1}
PS/*m*AgNP1-10	0.050	0.066	1.1×10^{-2}	2.4×10^{-2}	1.7×10^{-1}	3.6×10^{-1}
PS/*m*AgNP1-20	0.050	0.0588	1.6×10^{-2}	3.9×10^{-2}	2.7×10^{-1}	6.6×10^{-1}
PS/AgNP2	0.100	0.032	3.4×10^{-3}	5.0×10^{-3}	1.1×10^{-1}	1.6×10^{-1}
PS/*m*AgNP2-2	0.015	0.010	5.3×10^{-3}	3.0×10^{-2}	5.6×10^{-1}	3.2×10^{0}
PS/*m*AgNP2-10	0.015	0.010	1.5×10^{-2}	3.9×10^{-2}	1.5×10^{0}	3.9×10^{0}
PS/*m*AgNP2-20	0.015	0.0132	1.8×10^{-2}	2.5×10^{-2}	1.4×10^{0}	1.9×10^{0}

[a] without the addition of NH_3;

[b] with the addition of NH_3 at the concentration of 0.01%.

Table S3. The statistics of PS/*m*AgNP2-2 in catalytic reduction of 4-NP with different concentration of NH_3

Samples	$C(NH_3)$ (%)	*k'* (s^{-1})	*k'*/[M] ($L\cdot mmol^{-1}\cdot s^{-1}$)	*k'*/*k*
PS/*m*AgNP2-2 ([M]=9.95μM)	0	5.3×10^{-3}	5.6×10^{-1}	1
	0.002	6.0×10^{-3}	6.3×10^{-1}	1.1
	0.005	1.4×10^{-2}	1.5×10^{0}	2.7
	0.01	3.0×10^{-2}	3.2×10^{0}	5.7
	0.02	3.8×10^{-2}	4.0×10^{0}	7.1