Supporting Information

Poly(2-aminothiazole) as a unique precursor for nitrogen and sulfur co-doped porous carbon: Immobilization of very small gold nanoparticles and its catalytic application

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FT-IR analysis

FT-IR spectra of 2AT, P2AT, and (N, S)-PCM were given in Fig. S1, respectively. The bands at 3415 and 3292 cm^{-1} in the spectrum of 2AT are related to the asymmetrical and symmetrical N–H stretching modes of the $–NH_2$ group, respectively. The single broad band of N–H stretching at 3397 cm^{-1} in the spectrum of P2AT showed the formation of –N(H)– linkages, due to the reaction of $–NH_2$ group during polymerization. The peak at 1626 cm^{-1} in the FT-IR spectrum of 2AT and 1621 cm^{-1} in the spectrum of P2AT are ascribed to the C=N stretching bands. The absorption bands at 695 and 618 cm^{-1} in the spectra of 2AT and P2AT, respectively, are related to the C–S stretching vibration.

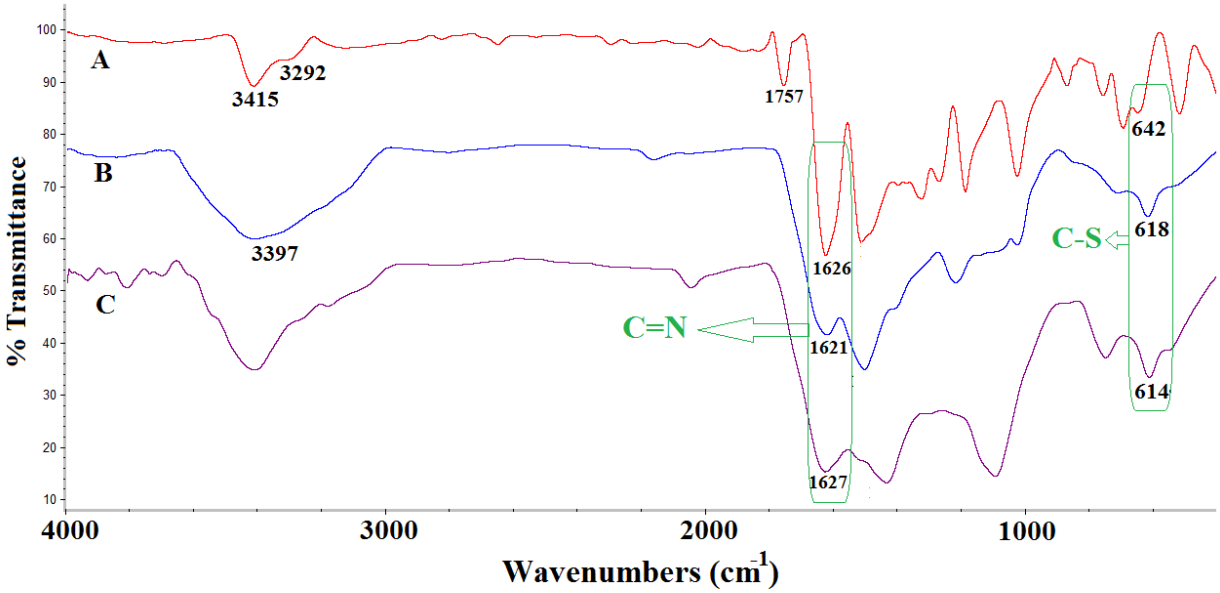

Fig. S1 FT-IR spectra of 2AT (A), P2AT (B) and (N, S)-PCM (C).

DTG analysis

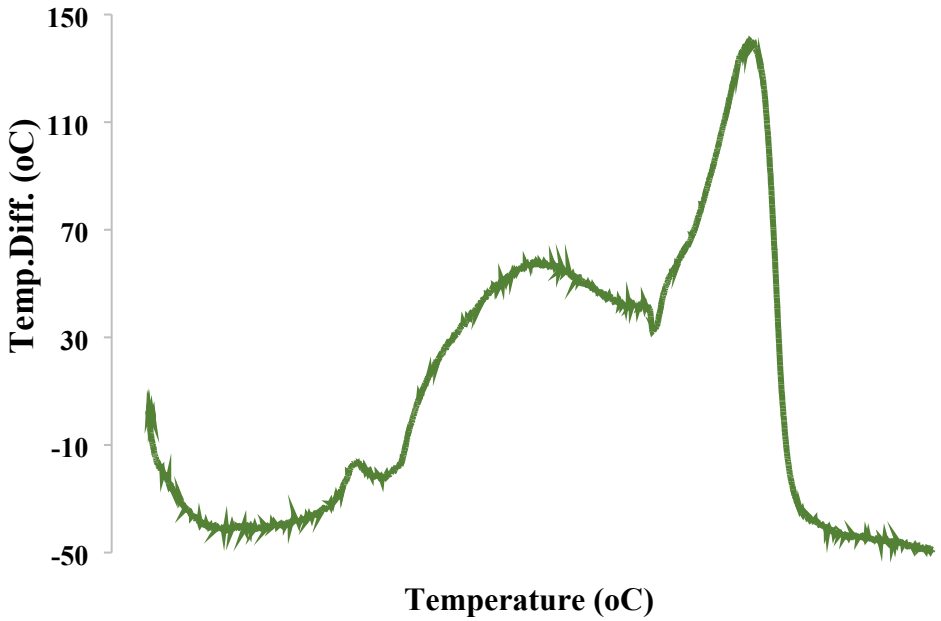

Fig. S2 DTA curve of P2AT.

BET analysis

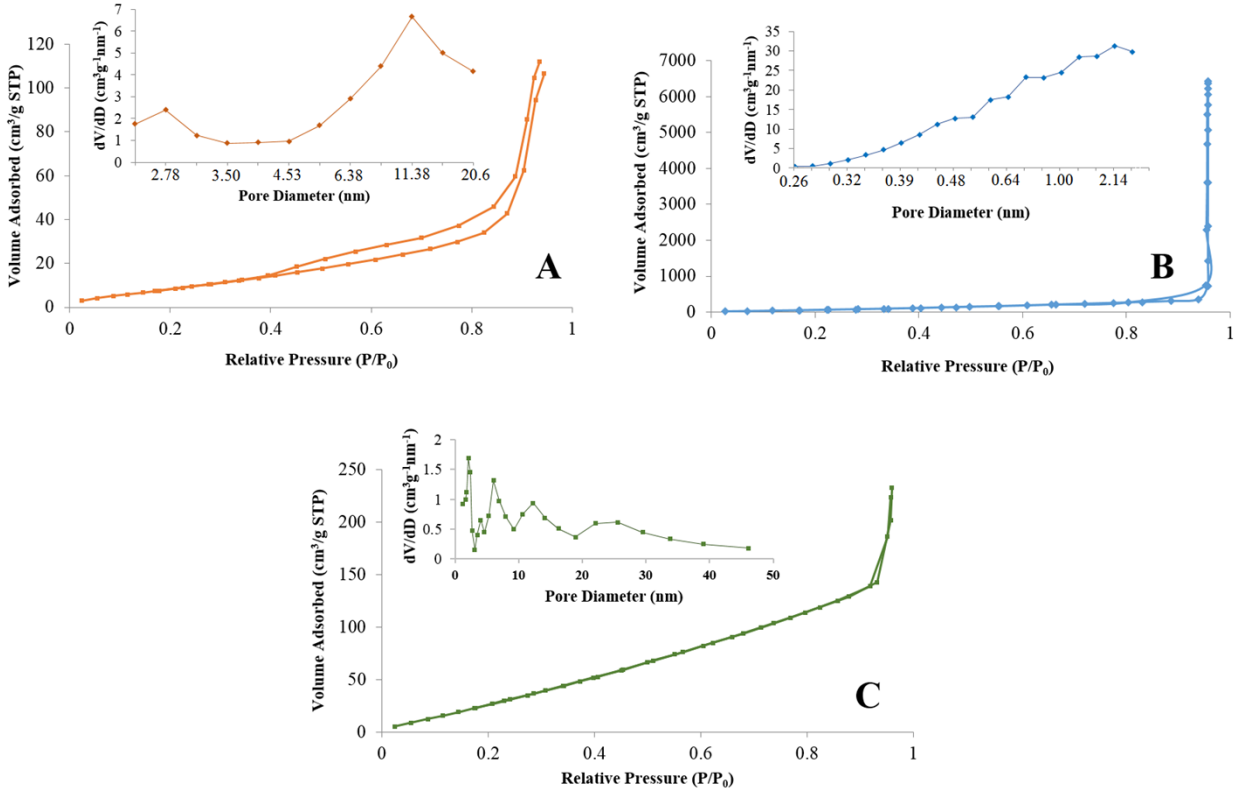

Fig. S3 Nitrogen adsorption isotherms of P2AT (A), (N, S)-PCM (B), and AuNPs@(N, S)-PCM (C). The inset shows the pore-size distribution obtained from adsorption branch using the BJH method.

UV-Vis spectra

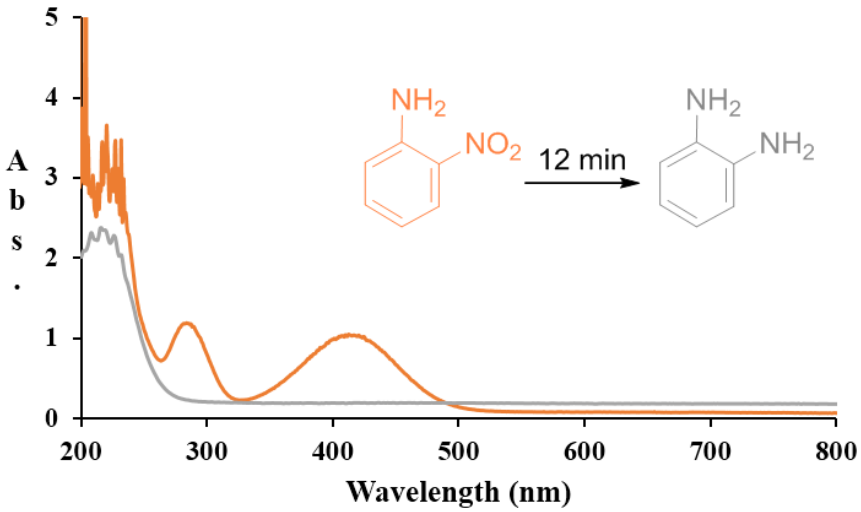

Fig. S4 UV-vis absorption spectra for the catalytic reduction of 2-nitroaniline by $NaBH_4$ in the presence of AuNPs@(N, S)-PCM as the catalyst.

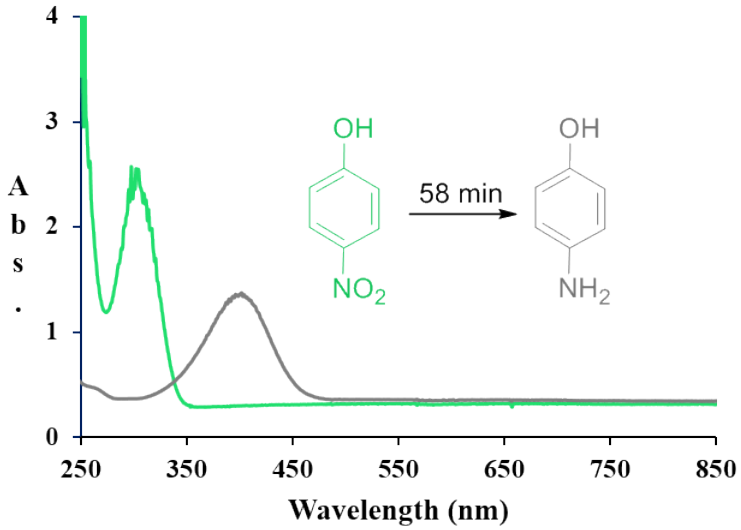

Fig. S5 UV-vis absorption spectra for the catalytic reduction of 4-nitrophenol by $NaBH_4$ in the presence of AuNPs@(N, S)-PCM as the catalyst.

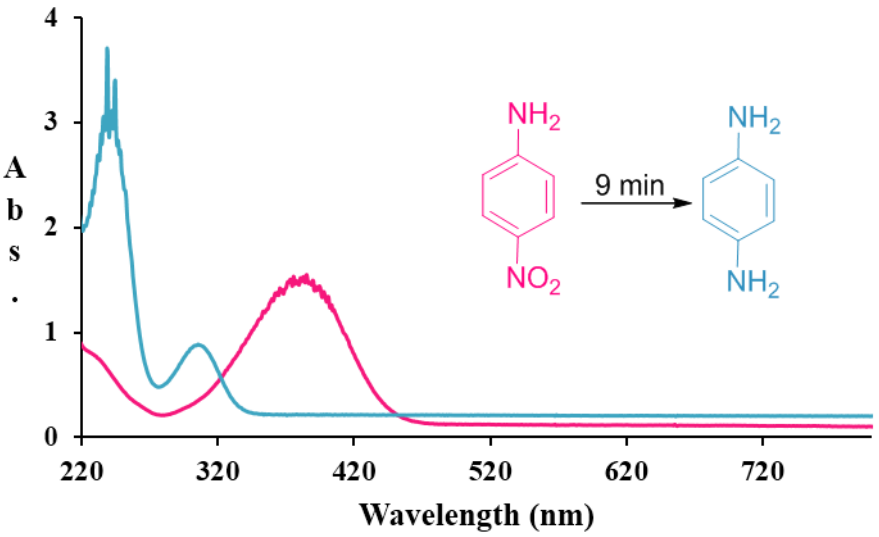

Fig. S6 UV-vis absorption spectra for the catalytic reduction of 4-nitroaniline by $NaBH_4$ in the presence of AuNPs@(N, S)-PCM as the catalyst.

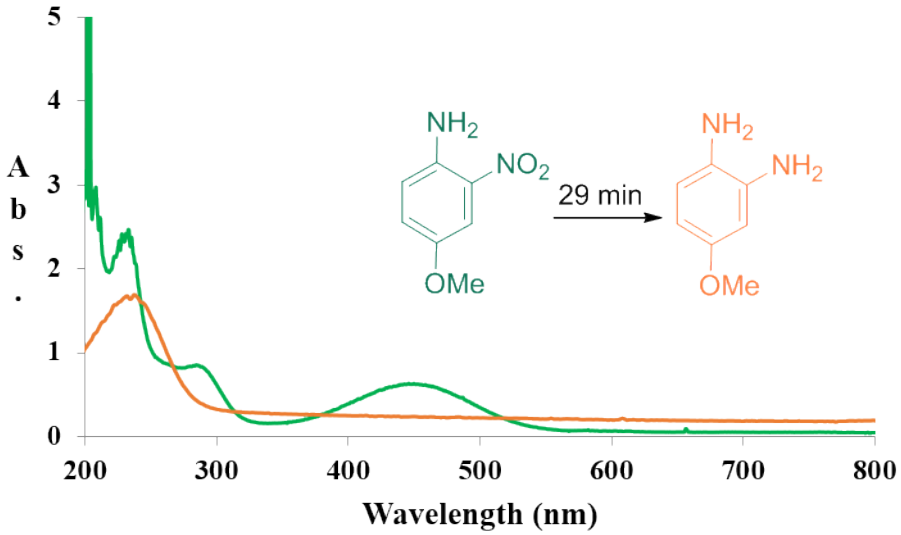

Fig. S7 UV-vis absorption spectra for the catalytic reduction of 4-methoxy-2-nitroaniline by $NaBH_4$ in the presence of AuNPs@(N, S)-PCM as the catalyst.

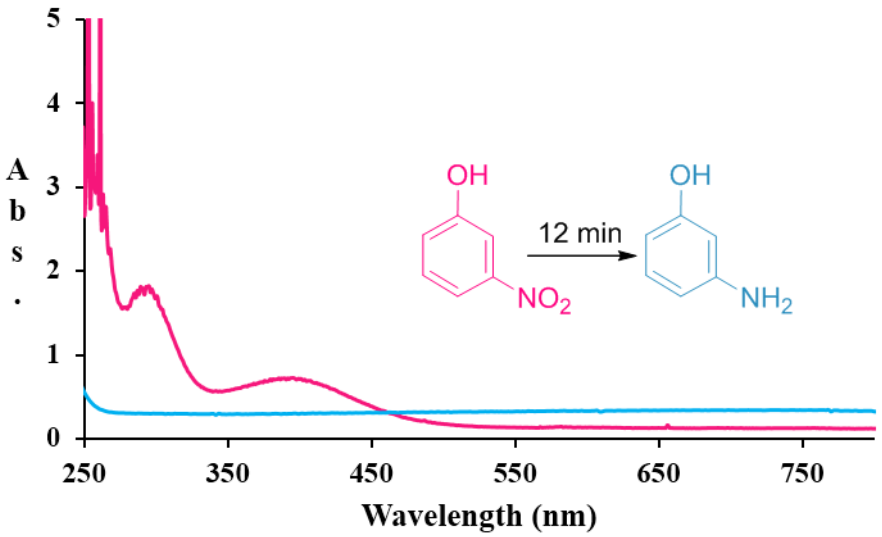

Fig. S8 UV-vis absorption spectra for the catalytic reduction of 3-nitrophenol by $NaBH_4$ in the presence of AuNPs@(N, S)-PCM as the catalyst.

Table S1 Comparison of various AuNPs catalysts of 2NA reduction with $NaBH_4$ as reducing agent.

Entry	Details of catalysts [Ref]	mol% Au (mol Au/mol 2NA×100)	$NaBH_4$ (mmol)	Time (min)
1	AuNPs on Graphene oxide[1]	2.2	0.36	1
2	AuNPs on Silica nanorattles[2]	3.17	0.2	21
3	AuNPs on amino-functionalized silica nanoparticles with center-radially hierarchical mesopores[3]	0.67	0.06	6
4	AuNPs encapsulated within hollow silica nanospheres[4]	0.16	0.3	22
5	Au@SiO_2 yolk-shell nanoreactors[5]	21.8	1.2	20
6	**This work**	**0.63**	**0.02**	**12**

Recyclability

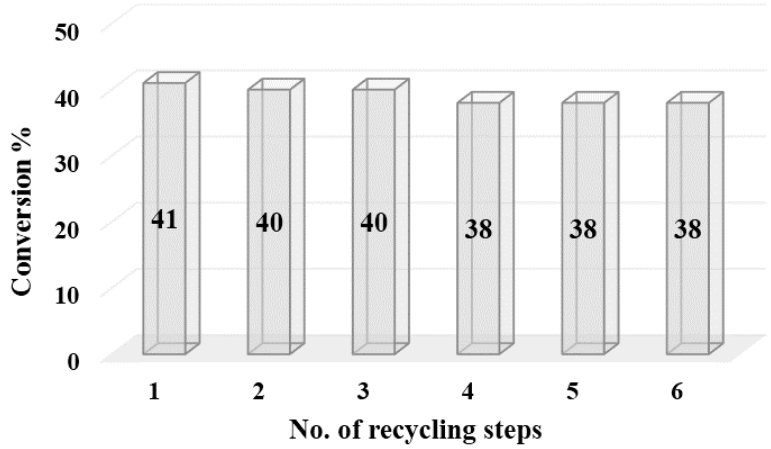

Fig. S9 Effect of recycling on the catalytic activity of AuNPs@(N, S)-PCM after 4 min.

Refrences

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