Supplementary Material (ESI) for RSC Advances.

Immobilization of Palladium Catalyst on Magnetically Separable Polyurea Nanosupport

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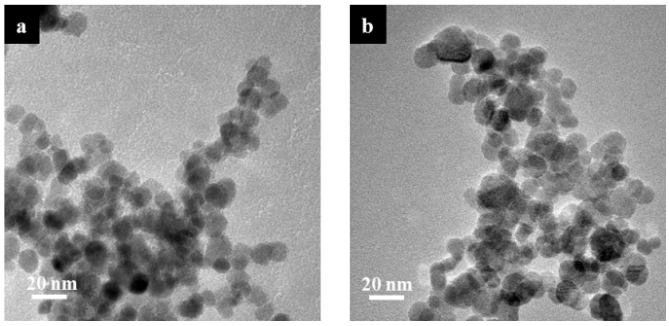


Fig. S1. TEM micrograph of a) magnetic nanoparticles and b) MNPs-IL-C_4.

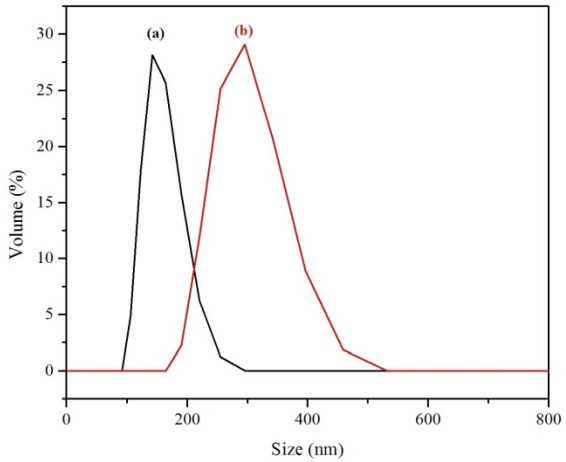


Fig. S2. Particle size distribution of a) pure PU NPs and b) MNPs-IL-C_4@PU NPs.

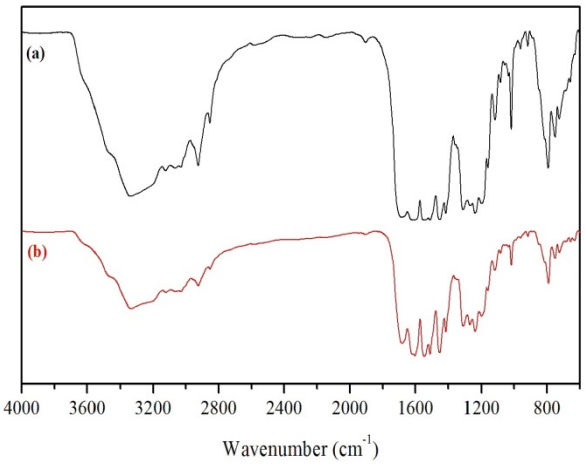


Fig. S3. Transmission FTIR spectra of a) pure PU NPs b) MNPs-IL-C_4@PU NPs.

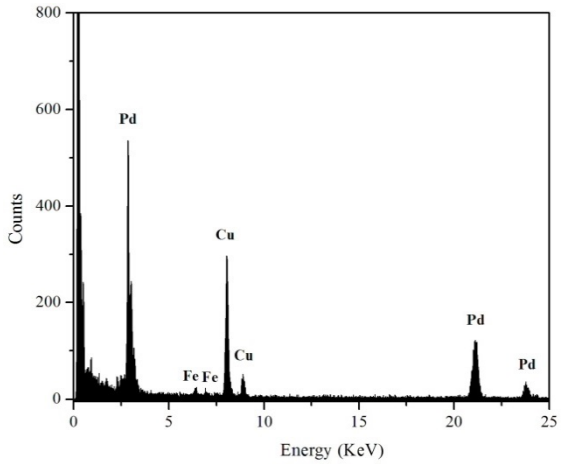


Fig. S4. EDS analysis of Pd_{ad} on the surface of MNPs-IL-C_4@PU NPs.

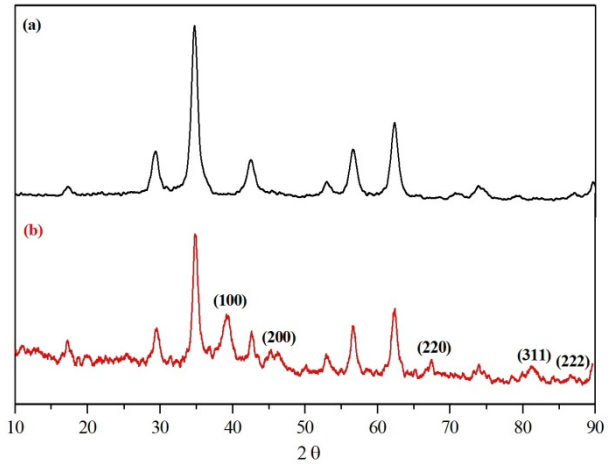


Fig. S5. XRD pattern of a) pure magnetite and b) Pd_{ad}/MNPs-IL-C_4@PU NPs.

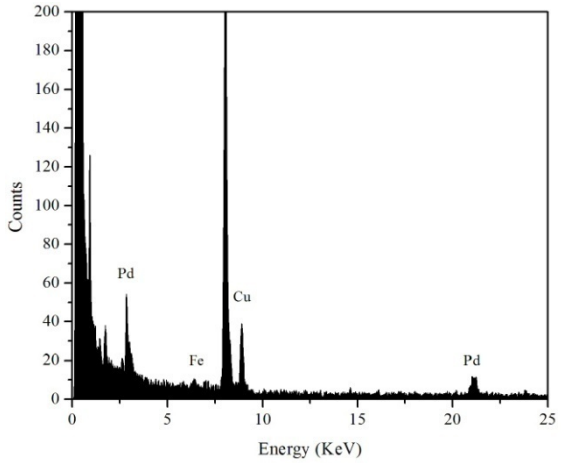


Fig. S6. EDS analysis of Pd_{en} within the MNPs-IL-C_4@PU NPs.

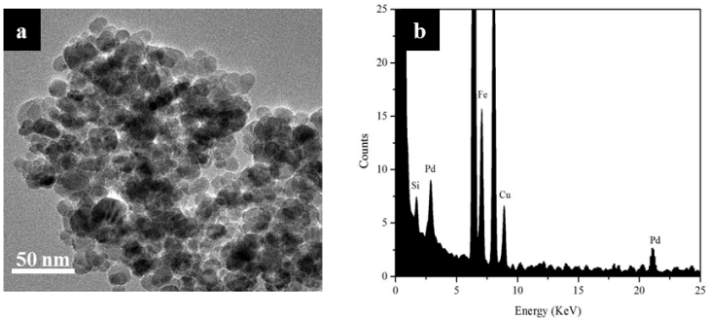


Fig. S7. a) TEM and b) EDS of Pd NPs supported on MNPs-IL-C_4.

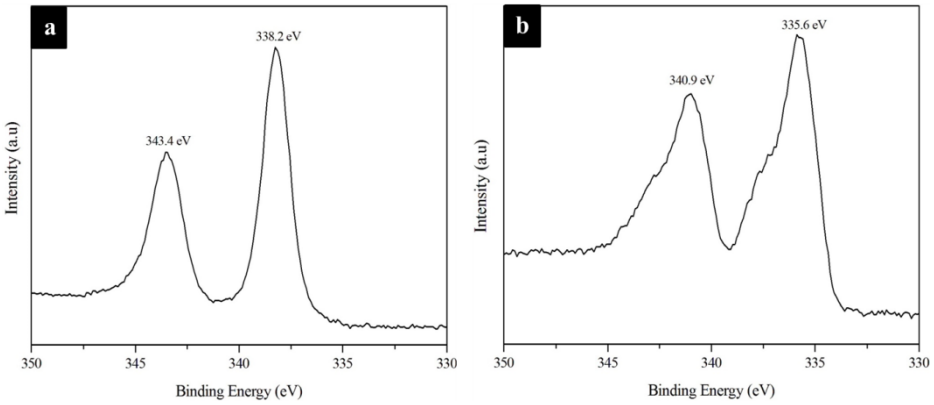


Fig. S8. XPS spectrum of the Pd_{ad} system a) before and b) after hydrogenation reaction showing Pd $3d_{5/2}$ and Pd $3d_{3/2}$ binding energies.

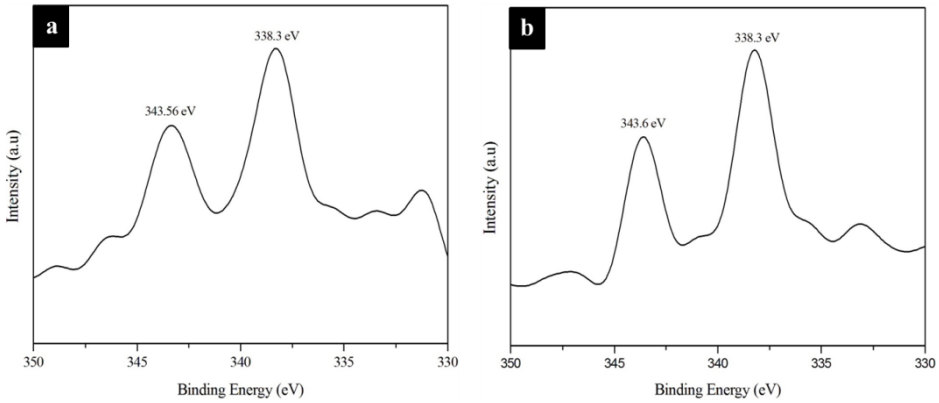
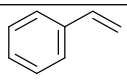
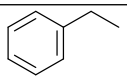
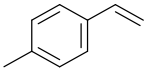
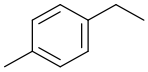
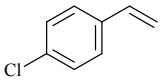
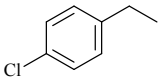
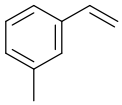
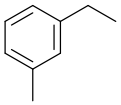
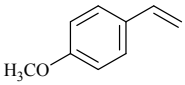
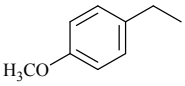
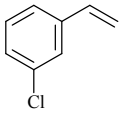
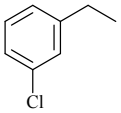


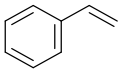
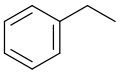
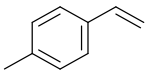
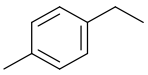
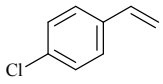
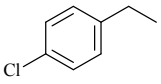
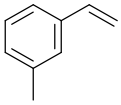
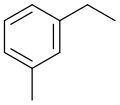
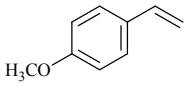
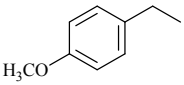
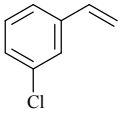
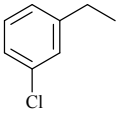
Fig. S9. XPS spectrum of the Pd_{en} system a) before and b) after hydrogenation reaction showing Pd $3d_{5/2}$ and Pd $3d_{3/2}$ binding energies.

Table S1. Hydrogenation reaction of aromatic alkenes catalysed by Pd_{ad}/MNPs-IL-C_4@PU NPs.[a]

Entry	Substrate	Product[b]	Yield (%)[c]
1			100
2			100
3			100
4			100
5			100
6			100

[a] Reaction conditions: 1.1 g of the Pd_{ad}/MNPs-IL-C_4@PU NPs suspension in heptane containing 0.008 mmol of palladium catalyst, 1.6 mmol substrate in 5 mL heptane, 40 psi hydrogen, 2 h at 50 °C. [b] Products were characterized by ^{1}H-NMR spectroscopy. [c] Yield was determined by ^{1}H-NMR spectroscopy and GC.

Table S2. Hydrogenation reaction of aromatic alkenes catalysed by Pd_{en} system.[a]

Entry	Substrate	Product[b]	Yield (%)[c]
1			41 (100)[d]
2			48(65)[d]
3			67 (85)[d]
4			11 (38)[d]
5			27
6			0

[a] Reaction conditions: 1 g of the Pd encapsulated in MNPs-IL-C_4@PU NPs dispersed in heptane containing 0.008 mmol of palladium catalyst, 1.6 mmol substrate in 5 mL heptane, 40 psi hydrogen, 2 h at 50 °C. [b] Products were characterized by ^{1}H-NMR spectroscopy. [c] Yield was determined by ^{1}H-NMR spectroscopy and GC.[d] Yields obtained when the reaction time was prolonged to 6 h.