

A 3D Hierarchical Magnetic Fe@Pt/Ti(OH)₄ Nanoarchitecture for Sinter-Resistant Catalyst

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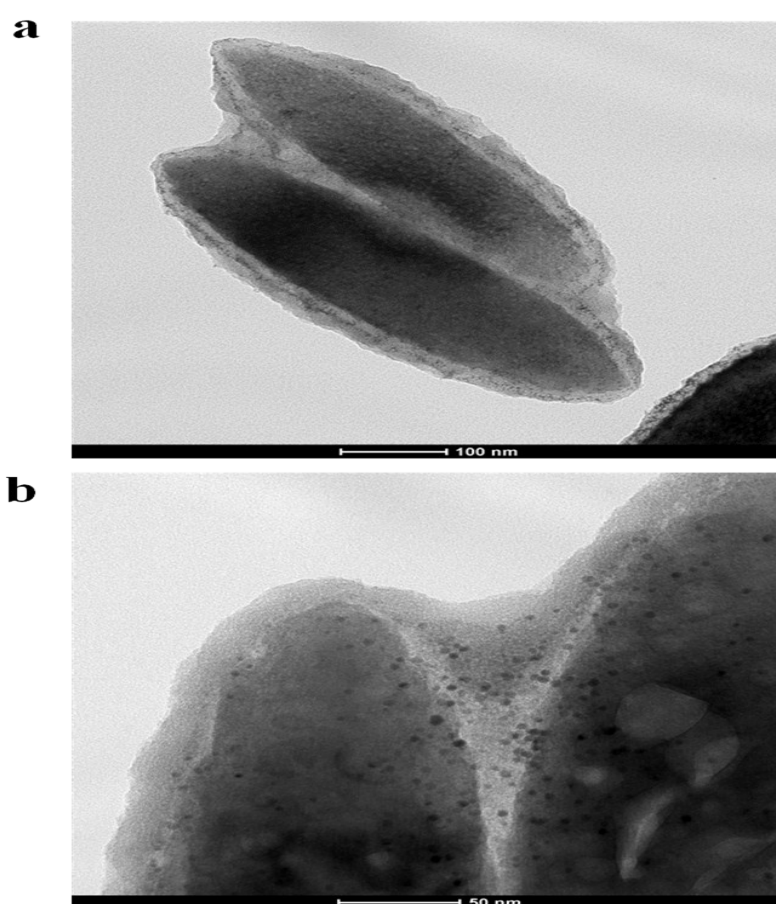


Fig. S1 TEM images of (a) α -Fe₂O₃@C/Pt/TiO₂, (b) calcined α -

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$\text{Fe}_2\text{O}_3@C/\text{Pt}/\text{TiO}_2/\text{mSiO}_2$ at 500 °C in air for 4h.

The loaded Pt NPs could be clearly observed between carbon and TiO_2 layer, demonstrating the synthesis of $\alpha\text{-Fe}_2\text{O}_3@C/\text{Pt}/\text{TiO}_2$ sample.

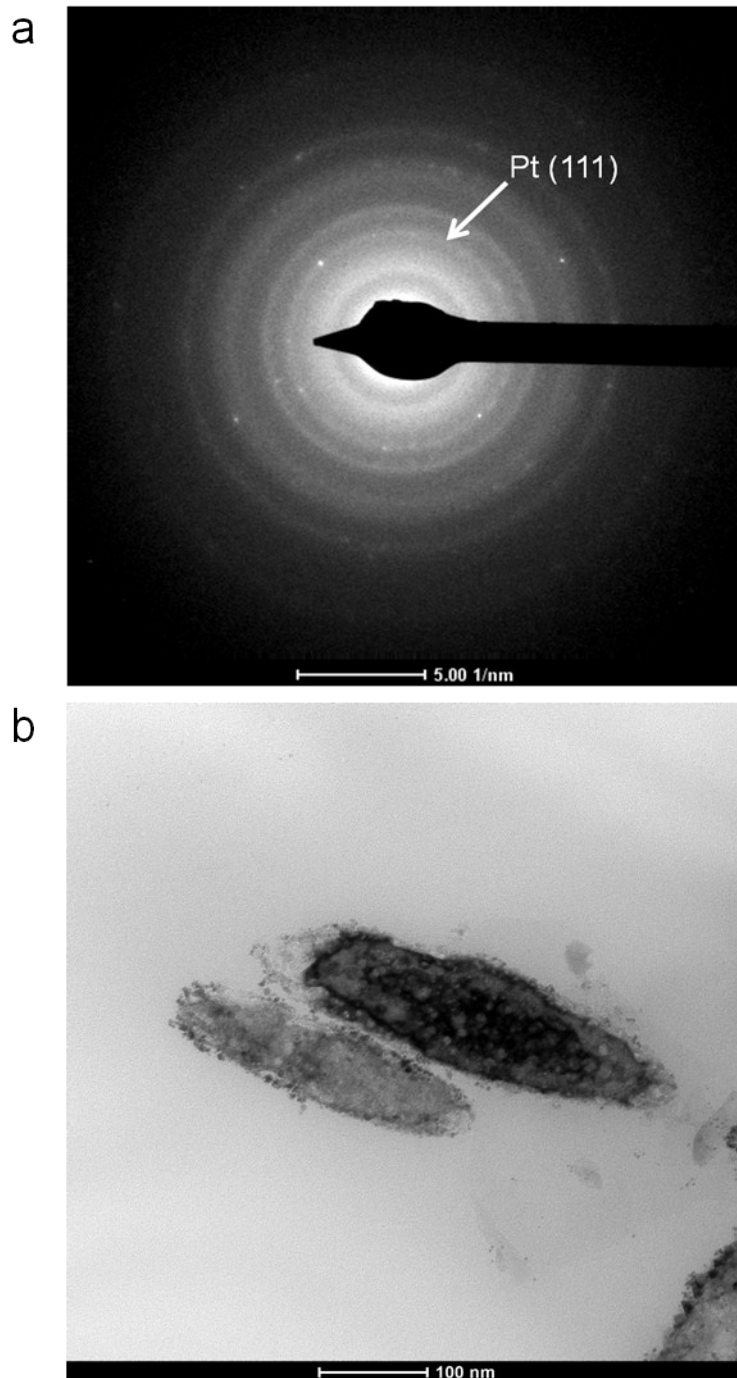


Fig. S2 (a) SAED pattern obtained from calcined $\alpha\text{-Fe}_2\text{O}_3@\text{Pt}/\text{Ti}(\text{OH})_4$ at 500 °C; (b) the TEM image of $\alpha\text{-Fe}_2\text{O}_3@\text{Pt}/\text{Ti}(\text{OH})_4$ treated with dilute HCl solution (10 Wt%) at room temperature.

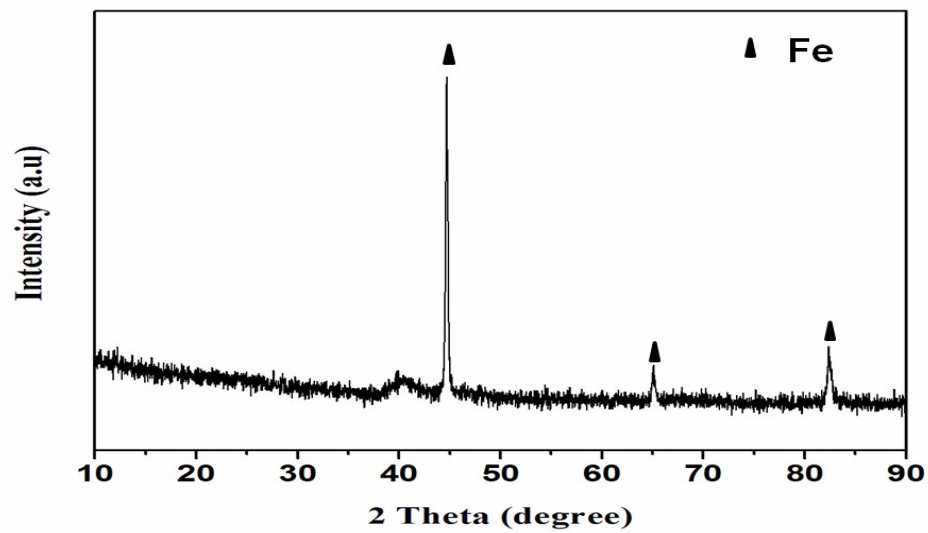


Fig. S3 XRD patterns of $\text{Fe}@\text{Pt}/\text{Ti}(\text{OH})_4$.

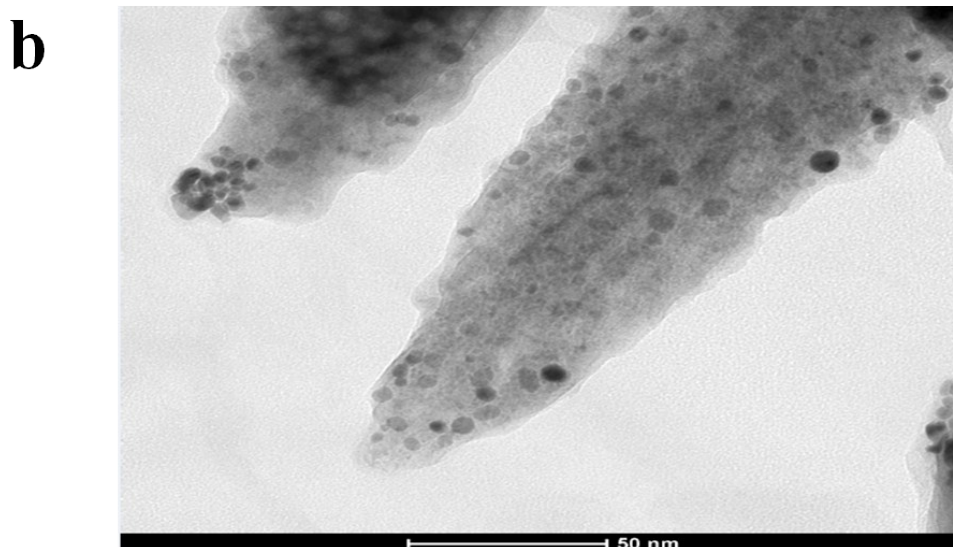
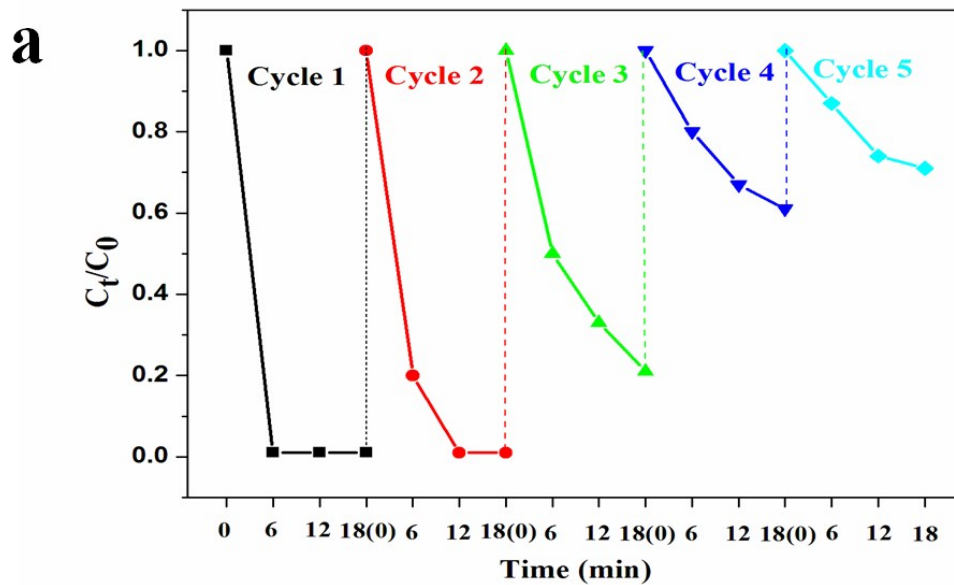


Fig. S4 (a) C_t/C_0 as a function of the reaction time in five successive reduction using TN500 catalyst, (b) TEM image of the final TN500 catalyst.

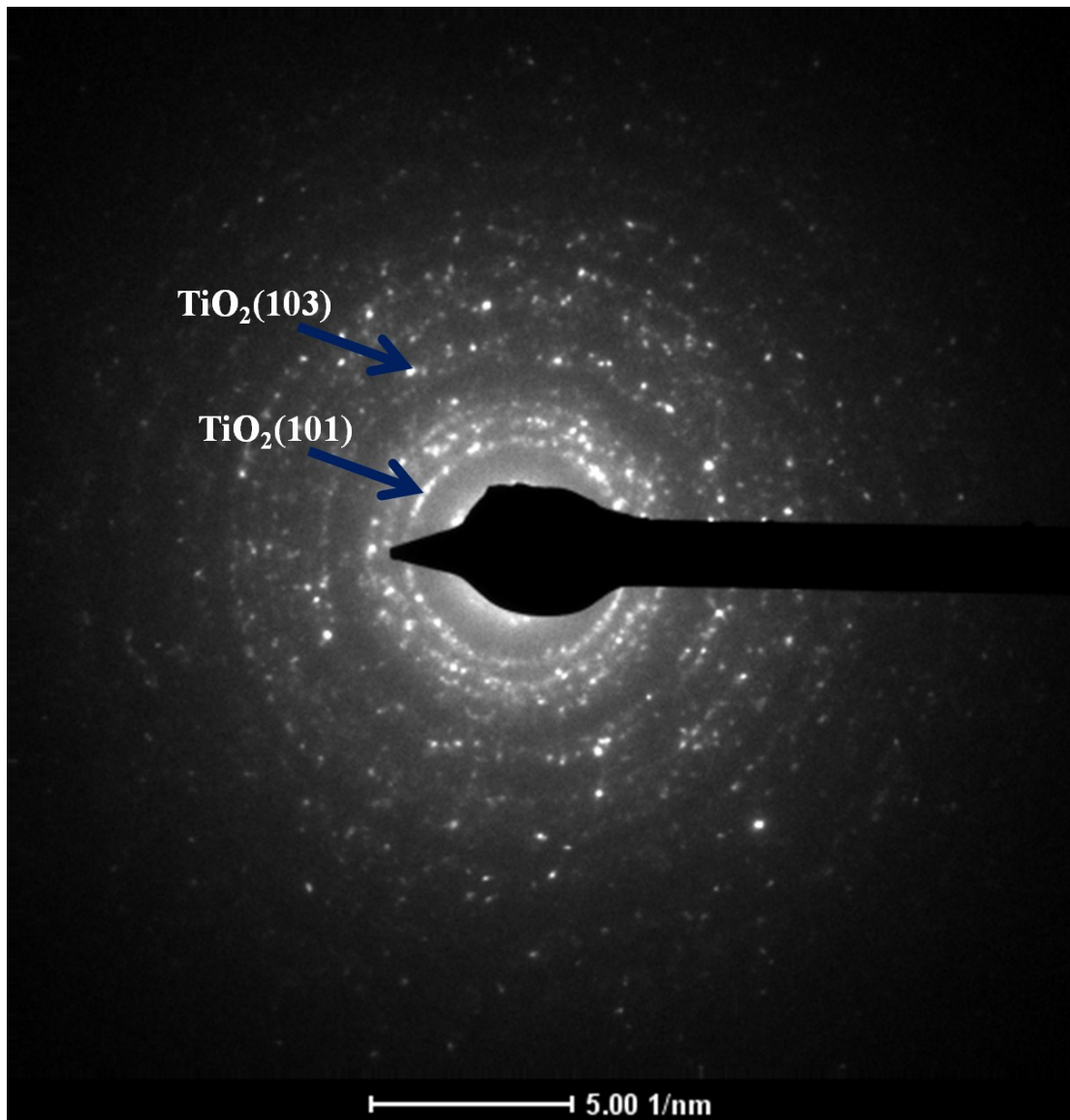


Fig. S5 SAED pattern obtained from Fe@Pt/Ti(OH)₄ calcined at 700 °C.

Table S1 Comparison of rate constant for the catalytic reduction of 4-NP by NaBH₄ using Pt-based nanocatalysts.

Catalyst	Size of noble metal NPs (nm)	Initial concentration of 4-NP (mM)	Amount of noble NPs (nmol)	k _{app} per noble NPs content (10 ⁻² s ⁻¹ μmol ⁻¹)	The multiple of k _{app}
Fe@Pt/Ti(OH) ₄ (This work)	4.15	0.1	56.38	5.1	1
ultra-small Pt NPs ¹	2.8	0.14	510	4.12	1.24
mSiO ₂ /Pt/TiO ₂ /Fe ²	4.52	0.1	203	3.6	1.42
dendritic Pt NPs ³	31.1	2	0.935	80	0.06
Porous AuPt particles ⁴	-	0.24	2564	2.145	2.38
PtCo/NaY ⁵	14	7.2	579.5	1.722	2.96

References

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