Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supplementary Information

A recyclable Mn-porphyrin catalyst for enantioselective epoxidation of unfunctionalized olefins using molecular dioxygen

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Table S1 Asymmetric oxidation of styrene by various Mn-pophyrins

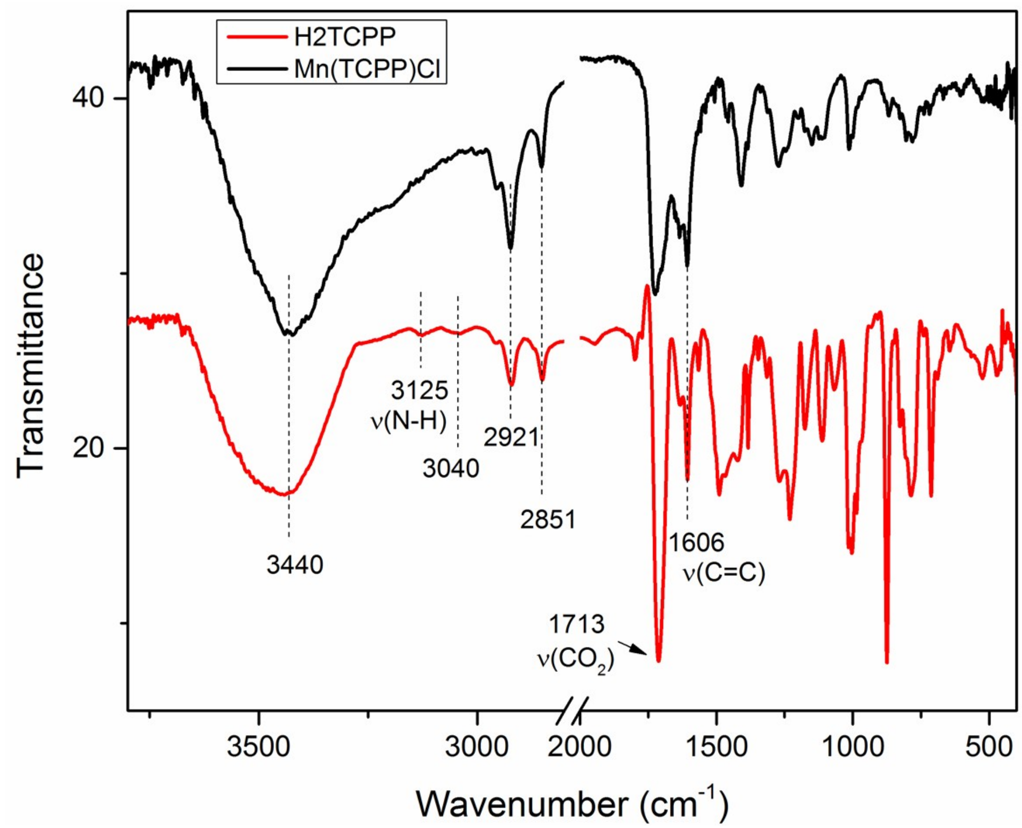


Fig. S1 FT-IR spectra of H_2TCPP and Mn(TCPP)Cl.

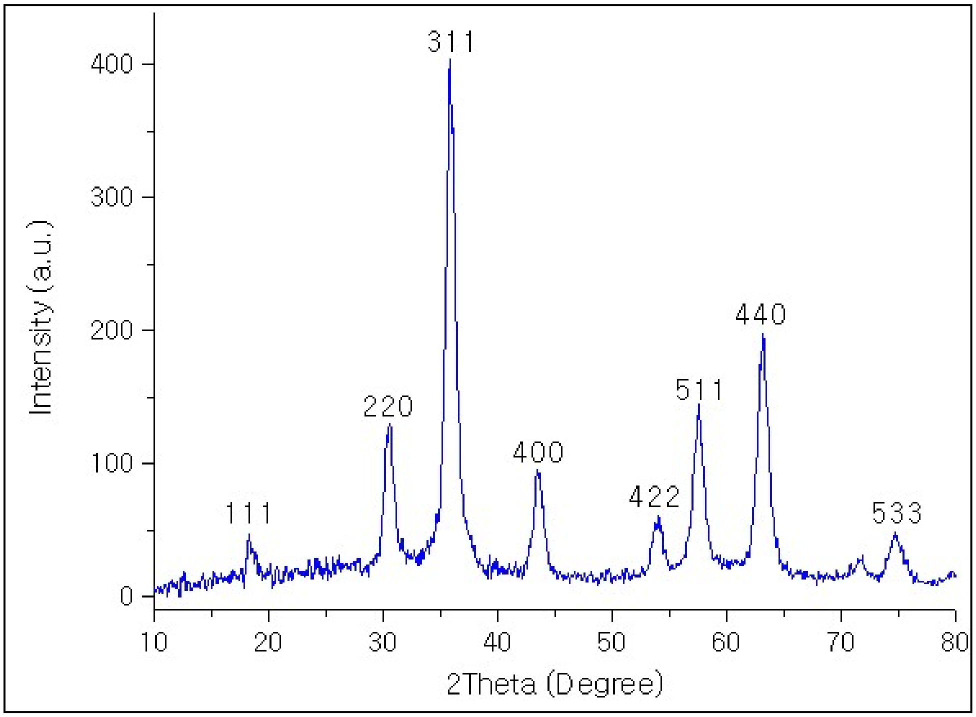


Fig. S2 X-ray powder diffractions of Fe_3O_4/tart/Mn(TCPP)Cl.

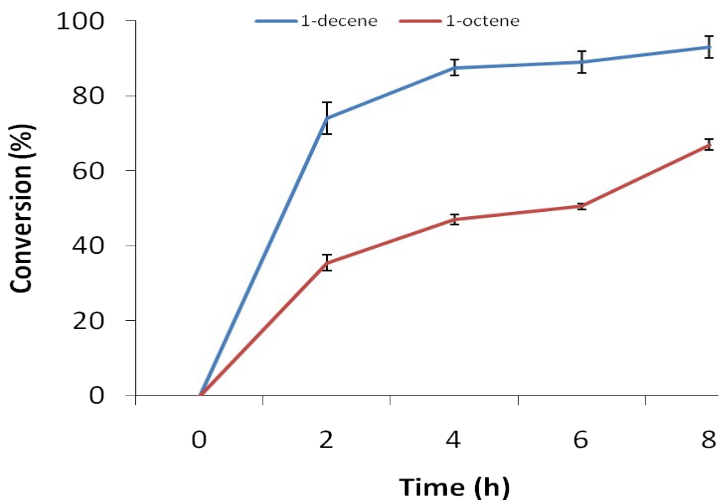


Fig. S3 Aerobic asymmetric oxidation of 1-decene and 1-octene against time. Reaction conditions: catalyst Fe_3O_4/tart/Mn(TCPP)Cl 1.0 mg (0.17 μmol Mn-porphyrin), substrate 2 mmol, chlorobenzene 0.1 g, isobutyraldehyde 5 mmol, CH_3CN 5 mL, O_2 balloon, reaction temperature 25 °C, reaction time 8 h.

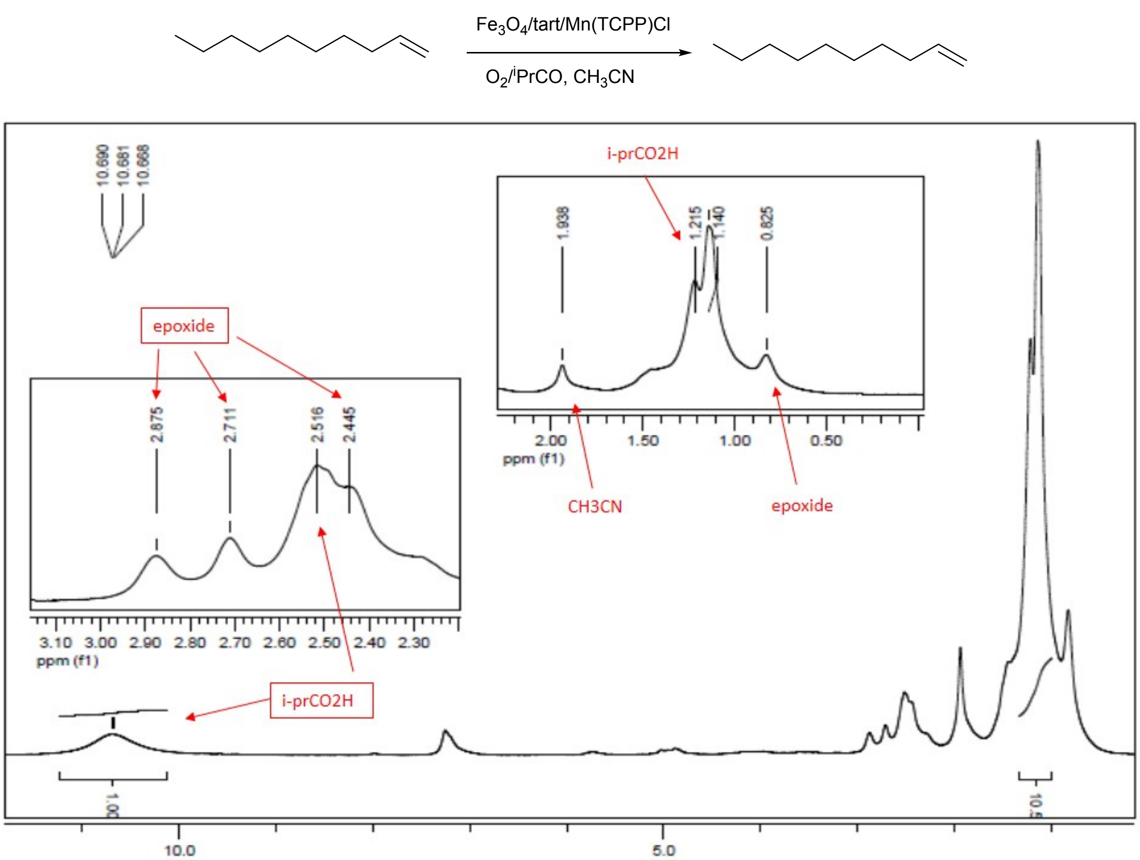


Fig. S4 [1]H-NMR spectrum in $CDCl_3$ of the crude product obtained upon oxidation of 1-decene provided 95% conversion with epoxide98%.

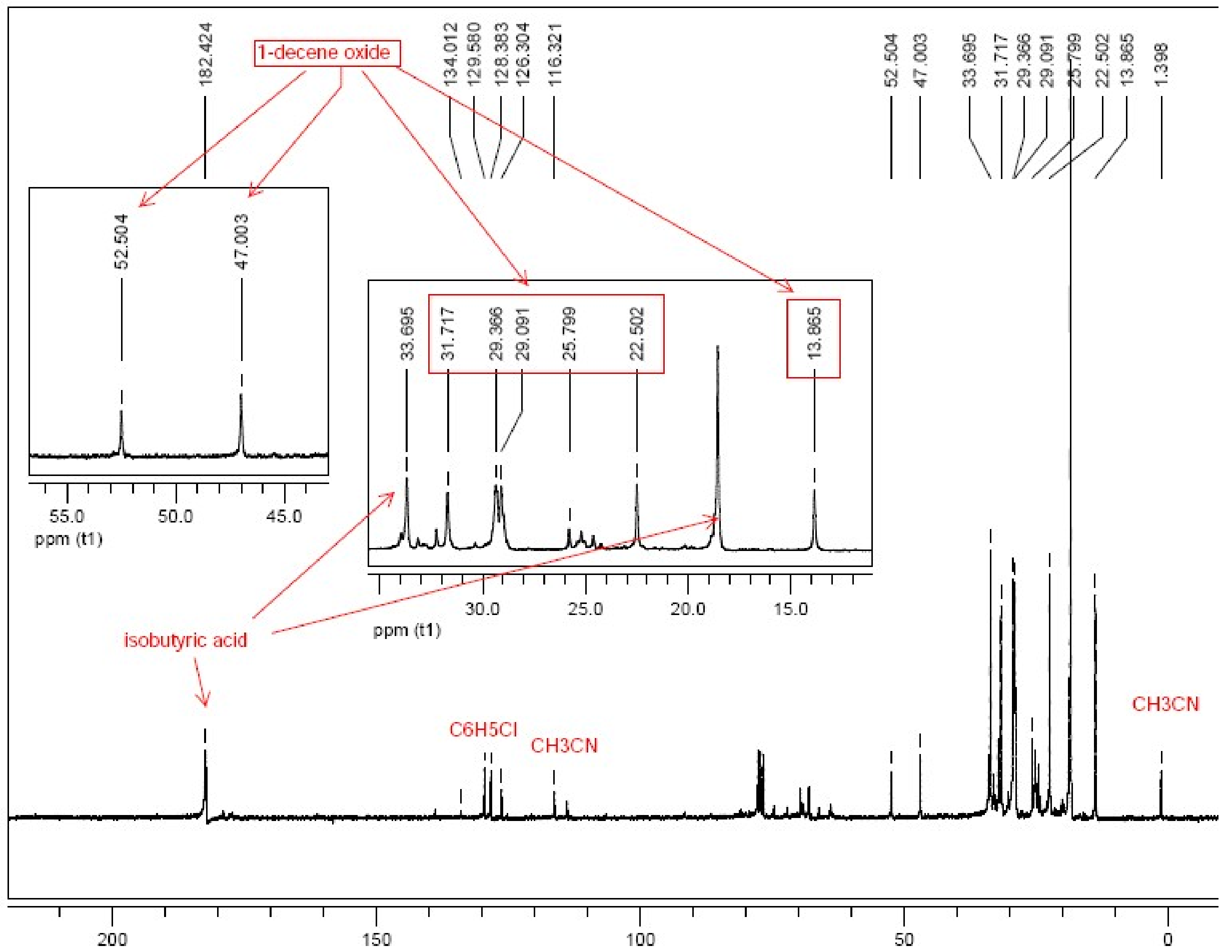


Fig. S5 ^{13}C-NMR spectrum in $CDCl_3$ of the crude product obtained upon oxidation of 1-decene provided 95% conversion with epoxide98%.

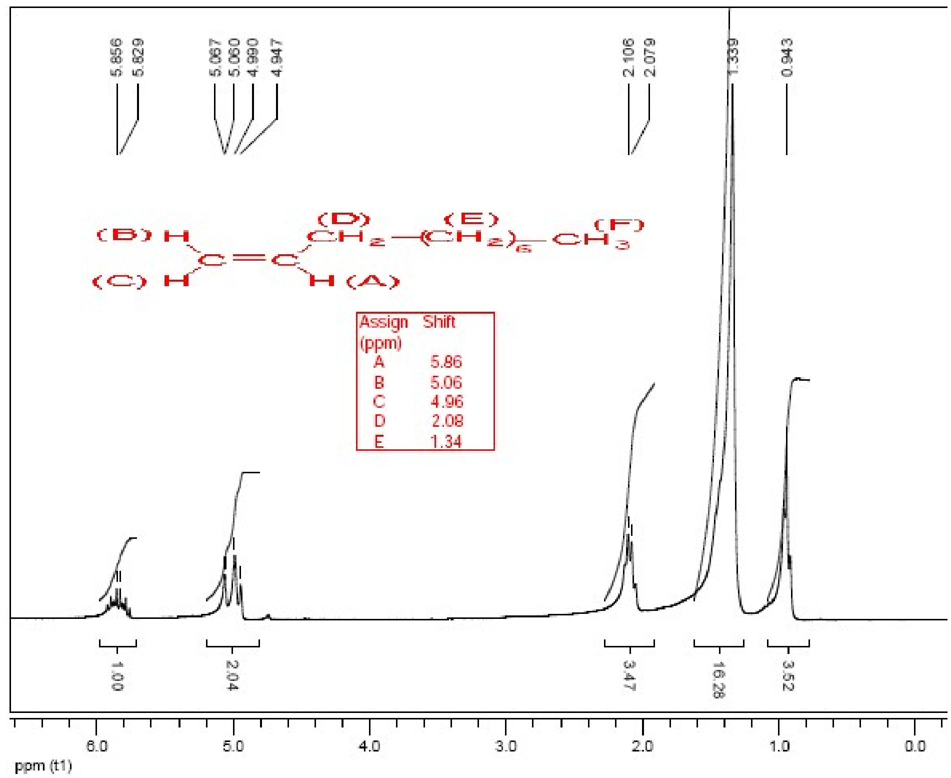


Fig. S6 ^{1}H-NMR spectrum of 1-decene in $CDCl_3$ as reference.

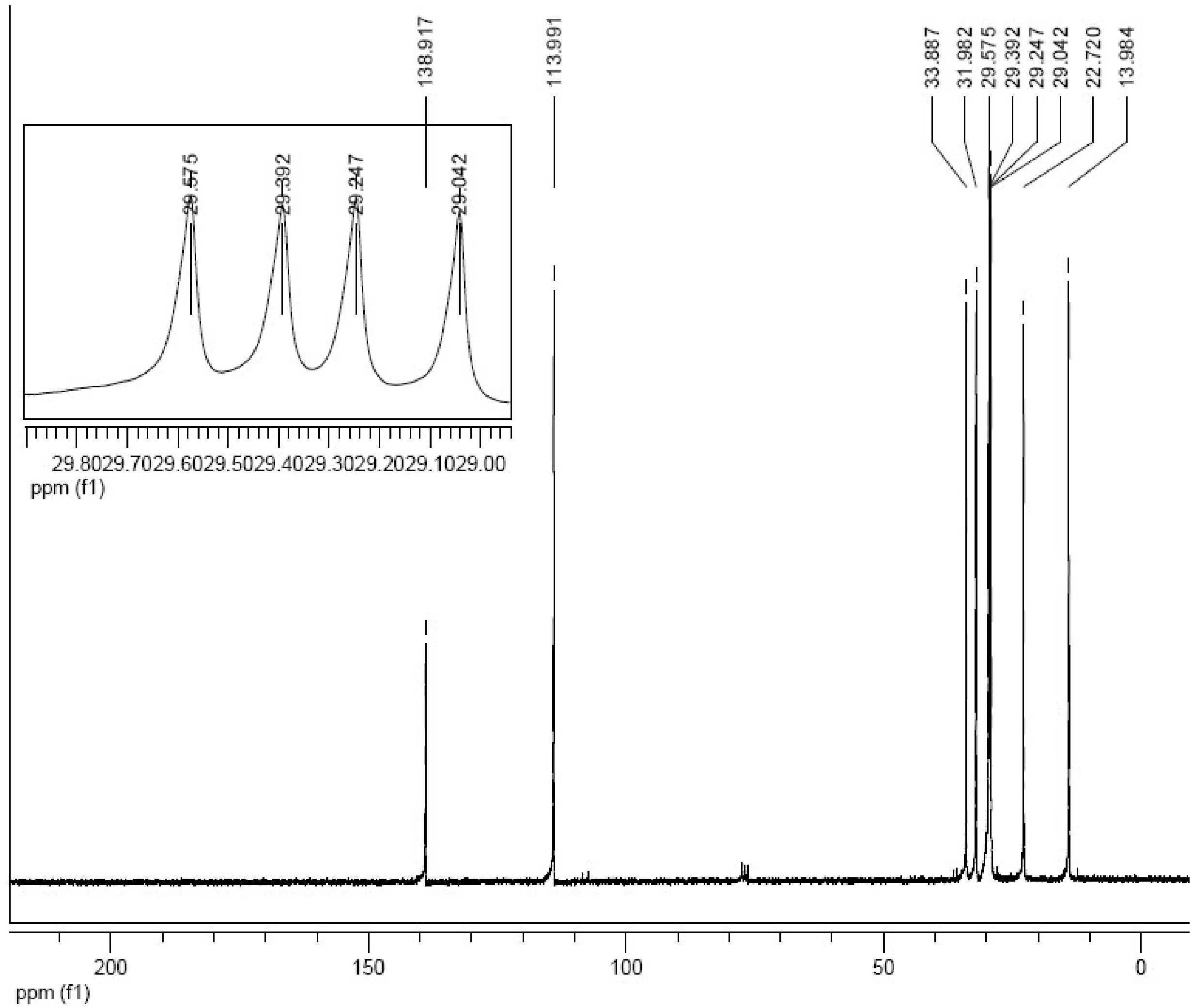


Fig. S7 ^{13}C-NMR spectrum of 1-decene in $CDCl_3$ as reference.

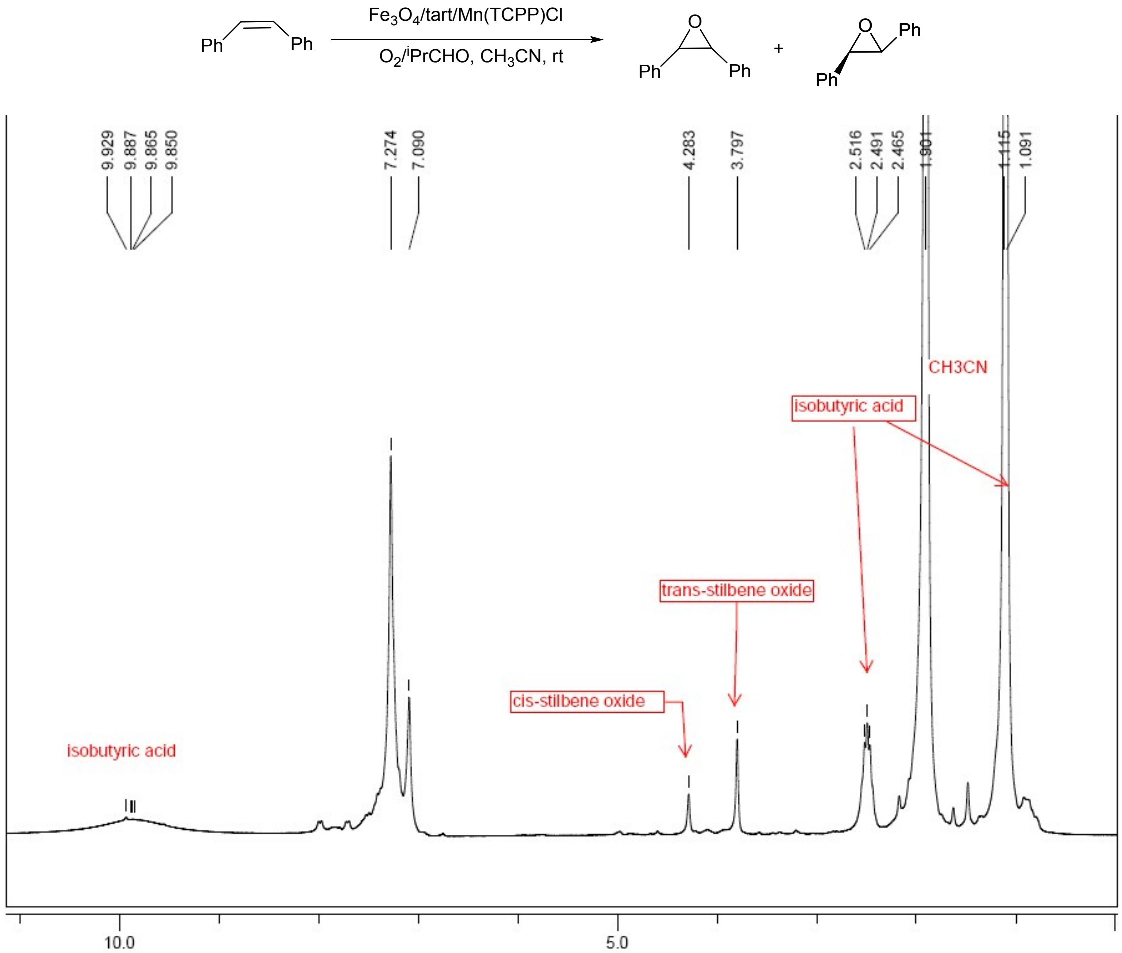


Fig. S8 [1]H-NMR spectrum in CDCl3 of the crude product obtained upon oxidation of *cis*-stilbene provided 100% conversion with 39% *cis*-epoxide, 5% *trans*-epoxide(R) and 56% *trans*-epoxide (S).

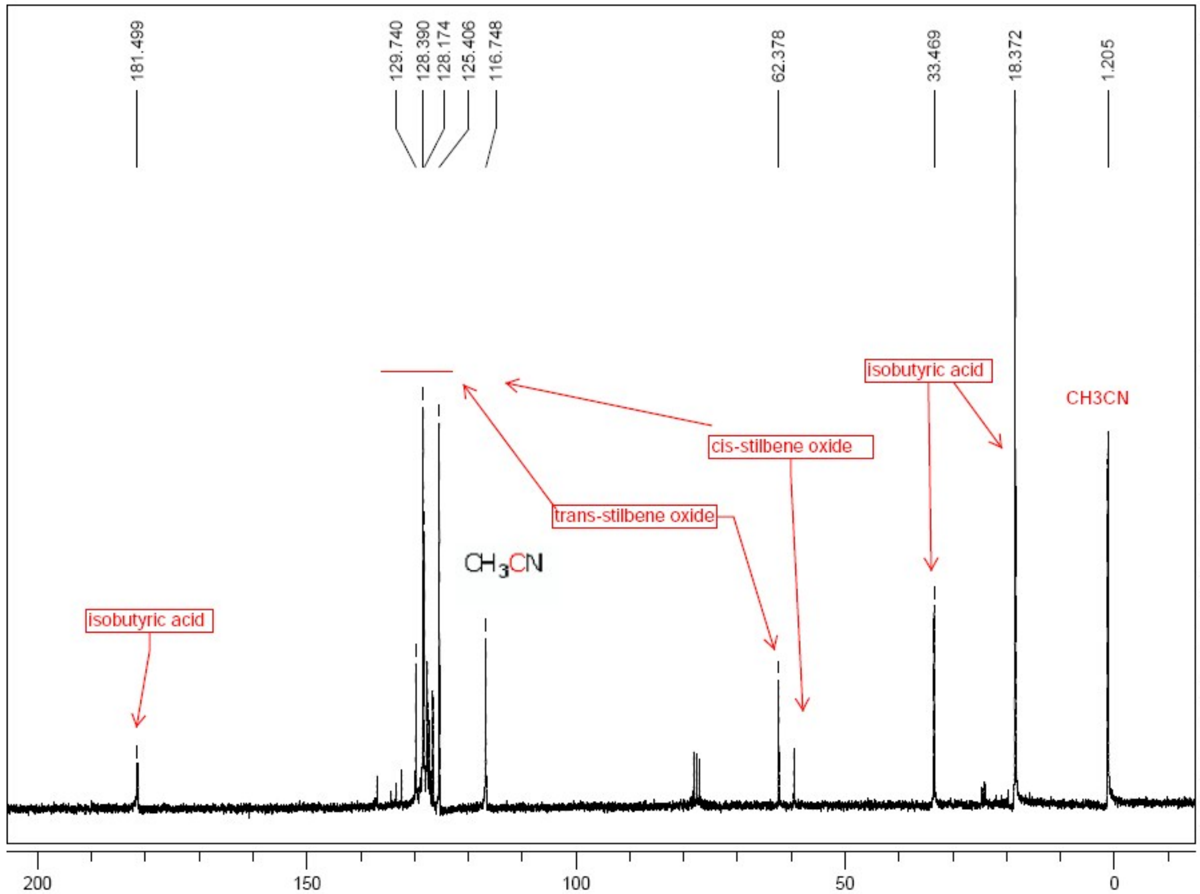


Fig. S9 [13]C-NMR spectrum in $CDCl_3$ of the crude product obtained upon oxidation of *cis*-stilbene provided 100% conversion.

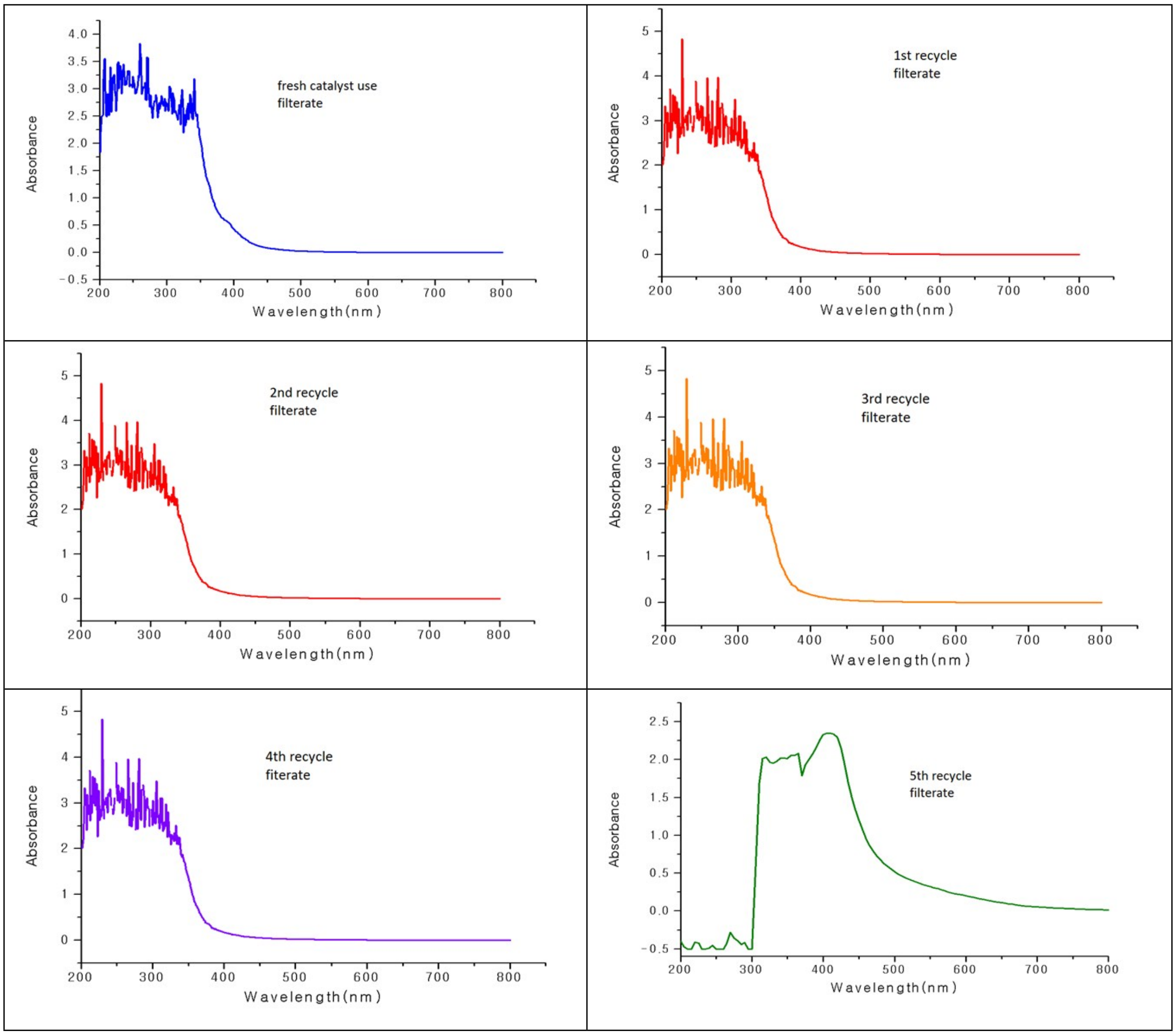
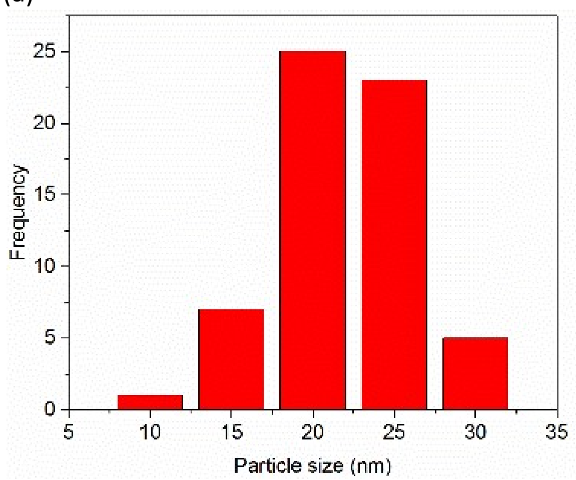


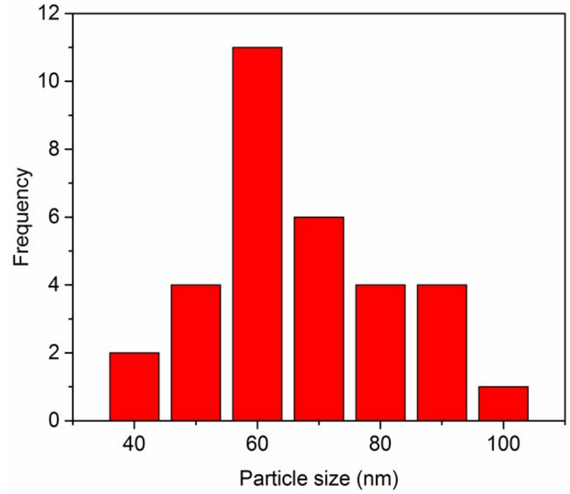
Fig. S10 Spectra of the filtrates after each recycle of Fe_3O_4/tart/Mn(TCPP)Cl.

(a)



Average particles size 19.5 ± 4.2 nm.

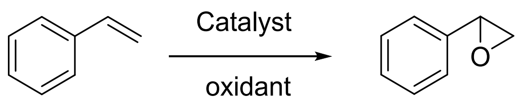
(b)

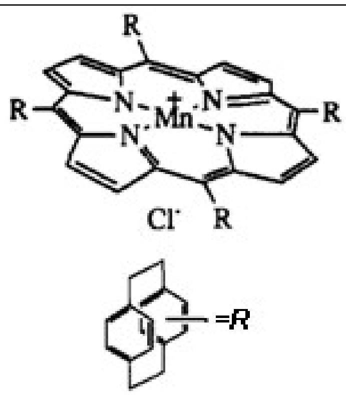
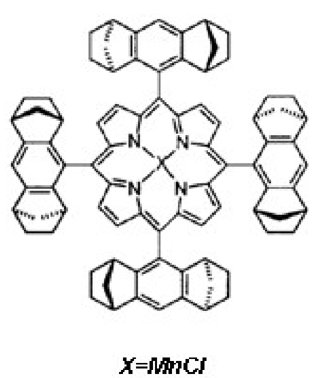
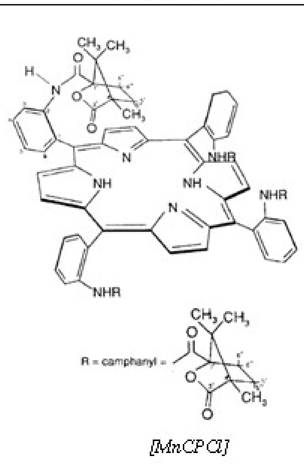


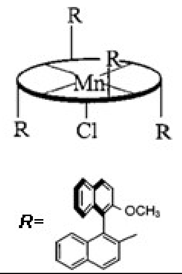
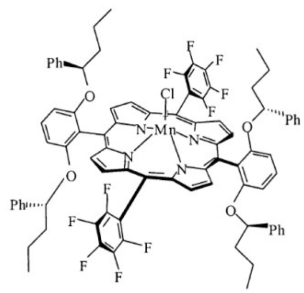
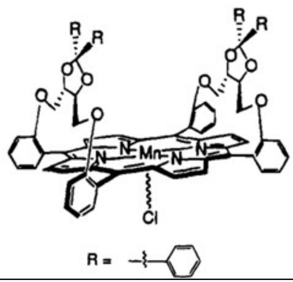
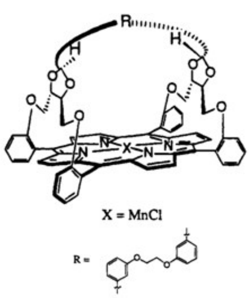
Average particles size 61 ± 16 nm.

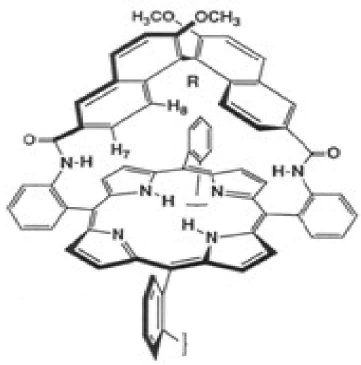
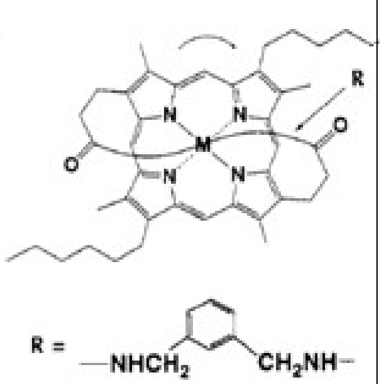
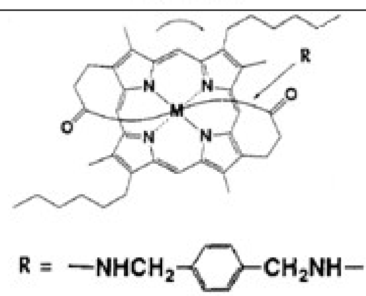
Fig. S11 Particle size distribution of (a) Fe_3O_4/tart and (b) Fe_3O_4/tart/Mn(TCPP)Cl

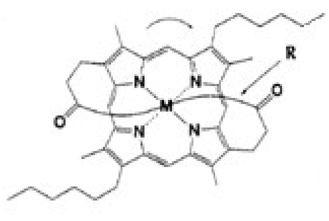
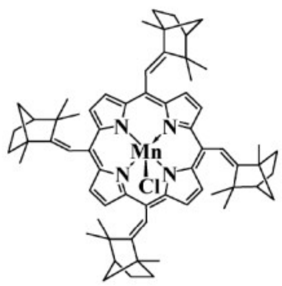
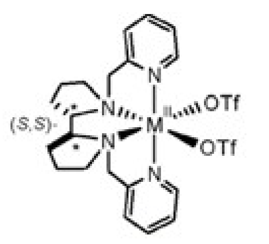
Table S1 Asymmetric oxidation of styrene by various Mn-pophyrins



No.	Catalyst	Oxidant	Time (h)	Epoxide Yield (%)	Ee % (Conf.)	Ref.
1	Fe_3O_4/tart/Mn(TCPP)Cl	O_2/^{i}PrCHO	8	67	67 (S)	This work
2		NaOCl	3	65	25 (R)	1
3		NaOCl	1	90	52 (S)	2
4		PhIO	12	51	20	3

No.	Catalyst	Oxidant	Time (h)	Epoxide Yield (%)	Ee % (Conf.)	Ref.
5		PhIO	3	37	8	4
6		PhIO	1.5	87	7.3	5
7		PhIO	1	64	39 (R)	6
8		PhIO	1	86	69 (R)	34

No.	Catalyst	Oxidant	Time (h)	Epoxide Yield (%)	Ee % (Conf.)	Ref.
9	 1 1-$Mn^{III}Cl$	PhIO	2	21	36 (R)	7
10	 *M=MnCl*	PhIO	3	27	30 (R)	36
11	 *M=MnCl*	PhIO	3	68	50 (R)	8

No.	Catalyst	Oxidant	Time (h)	Epoxide Yield (%)	Ee % (Conf.)	Ref.
12	 R = —NH–$(CH_2)_{12}$–NH— *M=MnCl*	PhIO	3	33	17 (R)	36
13		NaOCl	80	78	10	9
14	 *M=Mn*	H_2O_2	2.5	92	56 (R)	10

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