

Table S1 XRF analyze of Fe₃O₄/CS/HWO MNPs and Fe₃O₄/CS/HWO after being used 5 times (w %)

Items	Before	After	Items	Before	After
Fe ₂ O ₃	50.16	55.64	Al ₂ O ₃	0.082	0.057
WO ₃	47.54	42.75	CaO	0.063	0.038
Na ₂ O	1.24	0.91	ZnO	0.040	0.031
P ₂ O ₅	0.54	0.22	PbO	0.039	0.017
Cl	0.17	0.22	Cr ₂ O ₃	0.015	0.014
MnO	0.12	0.10			

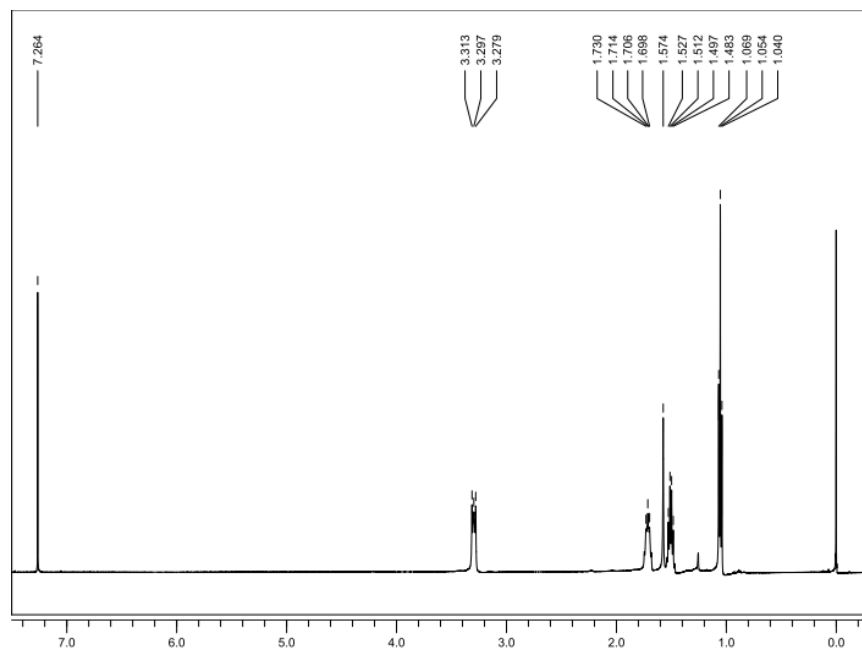


Figure S1 ¹H NMR (400 MHz, CDCl₃) of TPA₂[{WO(O₂)₂}₂(μ-O)]

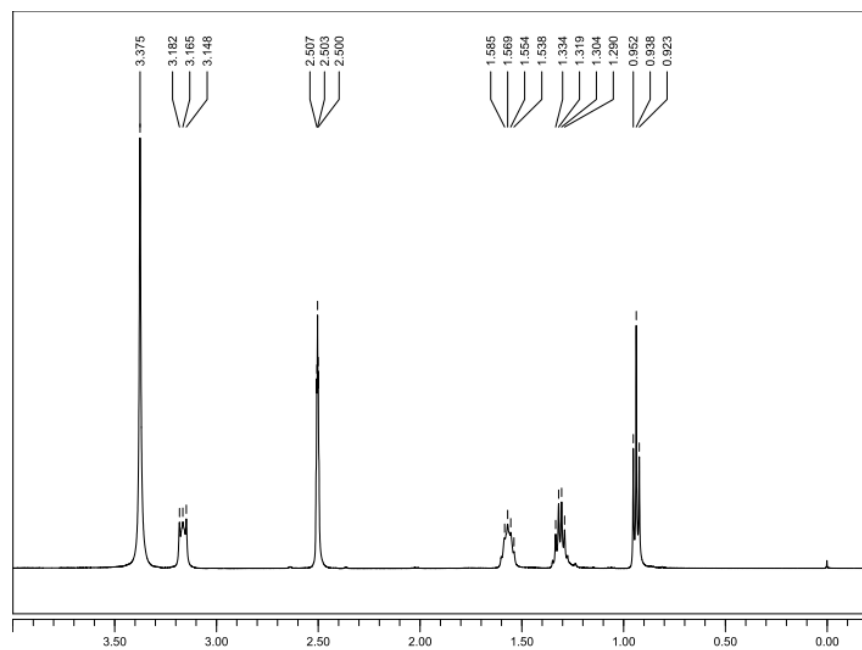


Figure S2 ¹H NMR (400 MHz, DMSO) of TBA₃[H{W₂O₂(O₂)₂(μ-O)}₂]

Phenyl methyl sulfoxide: ¹H NMR (400 MHz, CDCl₃) δ 7.62-7.60 (m, 2 H), 7.51-7.44 (m, 3 H), 2.68 (s, 3

H); ^{13}C NMR (100 MHz, CDCl_3) δ 145.55, 130.90, 129.22, 123.35, 43.80.

Diphenyl sulfoxide: ^1H NMR (400 MHz, CDCl_3) δ 7.66-7.64 (m, 4 H), 7.49-7.42 (m, 6 H); ^{13}C NMR (100 MHz, CDCl_3) δ 145.57, 131.03, 129.31, 124.76.

Phenyl benzyl sulfoxide: ^1H NMR (300 MHz, CDCl_3) δ 3.96 (s, 2 H), 6.94-7.32 (m, 10 H); ^{13}C NMR (75 MHz, CDCl_3) δ 63.5, 124.3, 128.2, 128.5, 128.8, 129.2, 130.3, 131.2, 142.6.

Dibenzothiophene sulfoxide: ^1H NMR (400 MHz, CDCl_3) δ 7.99 (d, $J = 7.6$ Hz, 2 H), 7.82 (d, $J = 7.7$ Hz, 2 H), 7.61 (t, $J = 7.5$ Hz, 3 H), 7.51 (t, $J = 7.5$ Hz, 3 H); ^{13}C NMR (100 MHz, CDCl_3) δ 145.18, 137.09, 132.53, 129.53, 127.53, 121.89.

9-Oxa-bicyclo[6.1.0]nonane: ^1H NMR (300MHz, CDCl_3) δ 2.93-2.86 (m, 2 H), 2.17-2.12 (m, 2 H), 1.67-1.44 (m, 8 H), 1.34-1.21 (m, 2 H); ^{13}C NMR (75 MHz, CDCl_3) δ 55.61, 26.55, 26.29, 25.60.

2-Hexyloxirane: ^1H NMR (300MHz, CDCl_3) δ 2.93-2.88 (m, 1 H), 2.74 (t, $J = 5.0$ Hz, 1 H), 2.46 (dd, $J = 5.0$ Hz, 2.7 Hz, 1 H), 1.57-1.30 (m, 10 H), 0.89 (t, $J = 6.8$ Hz, 3 H); ^{13}C NMR (75 MHz, CDCl_3) δ 52.44, 47.15, 32.56, 31.82, 29.17, 25.99, 14.10.

2-methyl-3-pentyloxirane: ^1H NMR (300MHz, CDCl_3) δ 2.73 (qd, $J = 5.4$ Hz, 5.2 Hz, 1 H), 2.62 (td, $J = 5.4$ Hz, 2.2 Hz, 1H), 1.55-1.25 (m, 11 H), 0.9 (t, $J = 6.8$ Hz, 3 H); ^{13}C NMR (75 MHz, CDCl_3) δ 59.86, 54.59, 32.10, 31.74, 25.78, 22.67, 17.73, 14.03.

2,3-epoxy-3-phenyl-propan-1-ol. ^1H NMR (400 MHz, CDCl_3) δ 1.98-2.20 (m, 1 H), 3.22 (dt, $J = 3.8$ and 2.2 Hz, 1 H), 3.76-3.83 (m, 1 H), 3.92 (d, $J = 2.2$ Hz, 1 H), 4.01-4.07 (m, 1 H), 7.20-7.40 (m, 5 H); ; ^{13}C NMR (100 MHz, CDCl_3) δ 136.8, 128.6, 128.4, 125.9, 62.7, 61.5, 55.8.

Nitrosobenzene: MS (70 eV, EI): 108, 107 [M^+], 93, 78, 77, 74, 51, 50.