Electronic Supplementary Material (ESI) for Polymer Chemistry.

Temporal control of RAFT polymerization *via* Magnetic Catalysis

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- ***Characterization data of the magnetic Fe_3O_4@Fe(II)-MOF catalyst***

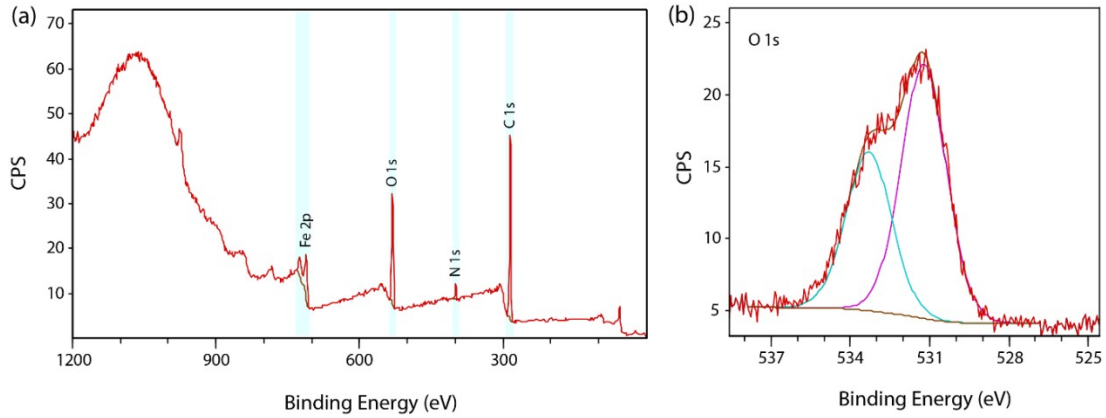

Fig. S1 Survey XPS spectrum of Fe_3O_4@Fe(II)-MOF (a), O1s orbital (b).

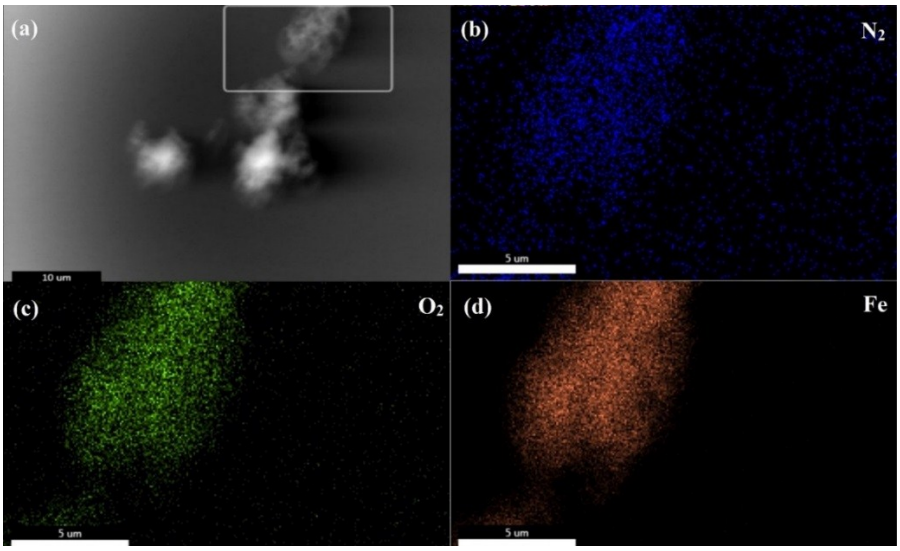

Fig. S2 (a) STEM-HAADF images of Fe_3O_4@Fe(II)-MOF, and (b-d) the corresponding EDS mappings.

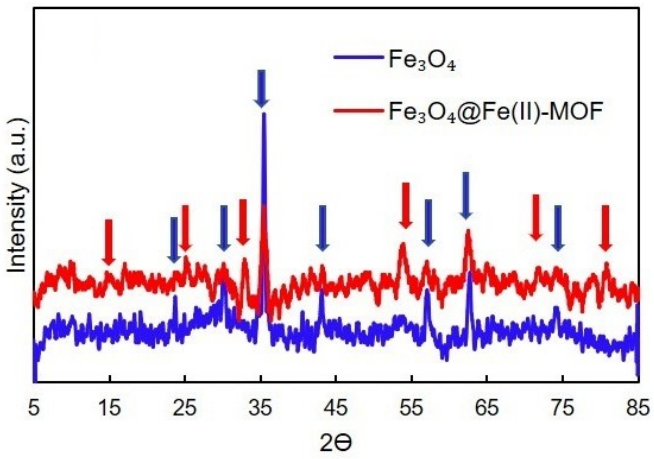

Fig. S3 XRD of Fe_3O_4 and Fe_3O_4@Fe(II)-MOF particles.

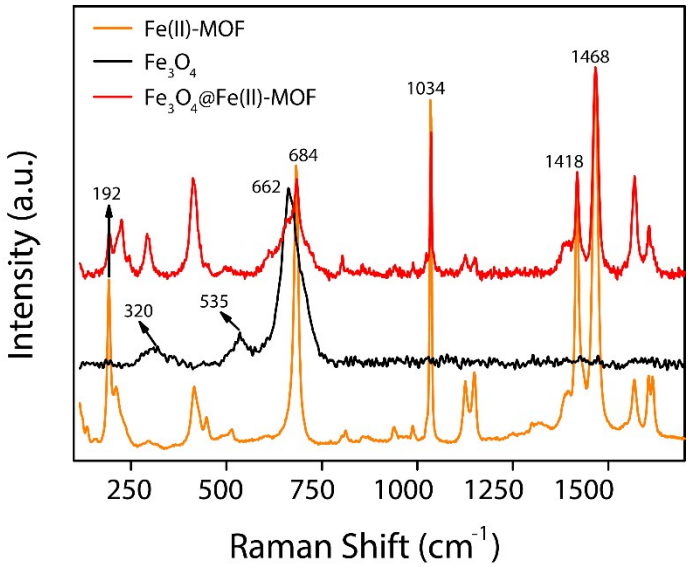

Fig. S4 Raman spectra of Fe_3O_4, Fe(II)-MOF, and Fe_3O_4@Fe(II)-MOF particles.

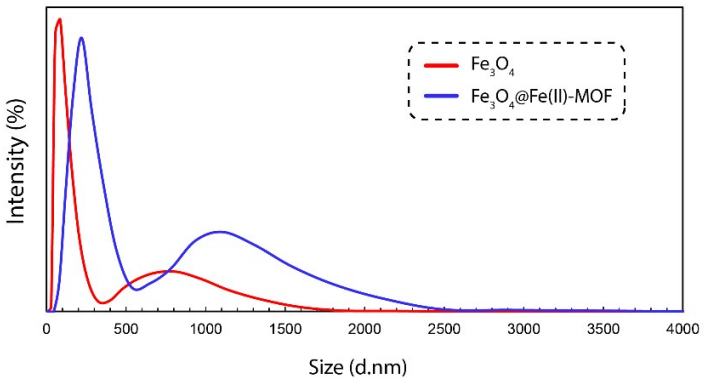

Fig. S5 DLS spectra of Fe_3O_4 and Fe_3O_4@Fe(II)-MOF particles.

- ***Zeta potential of the magnetic catalysts***

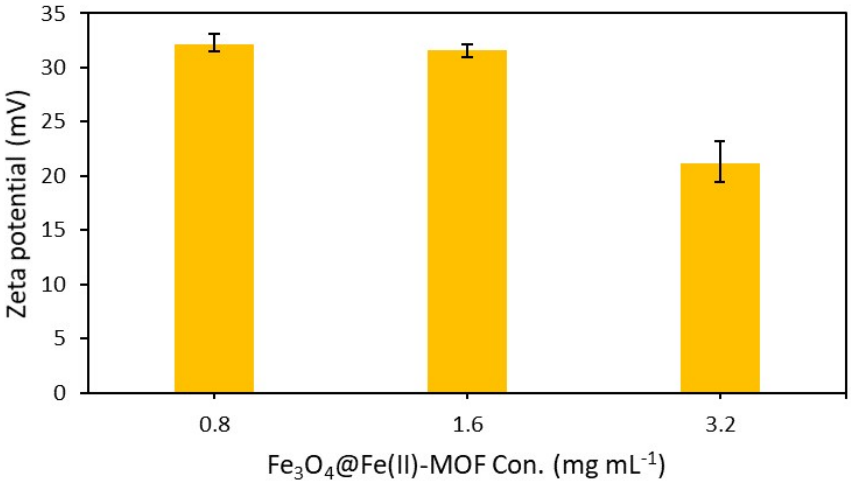

Fig. S6 Zeta potential of the Fe_3O_4@Fe(II)-MOF NPs at different concentrations as 0.8, 1.6, and 3.2 mg mL^{-1} obtained from three runs.

- ***Characterization data of the synthesized polymers via the magnetic Fenton-RAFT***

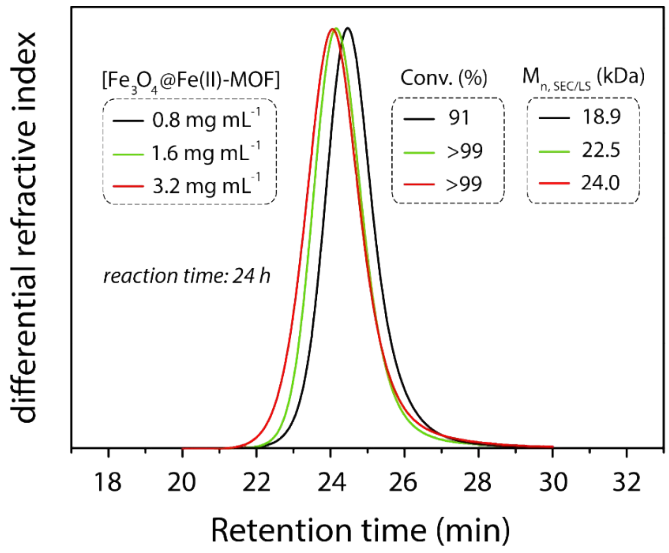

Fig. S7 SEC chromatograms of the synthesized PDMAs via the magnetic Fenton-RAFT after 24 h with different concentrations of Fe_3O_4@Fe(II)-MOF catalysts.

- ***Kinetic studies***

Table S1. Characterization data of the synthesized polymers within the kinetic studies on the magnetic Fenton-RAFT polymerization of DMA with [Fe(II)-MOF@Fe_3O_4] = 1.6 mg mL^{-1} and $[H_2O_2]_0$ = 35 mM.

Time (h)	**Conversion (%)[a]**	**$M_{n,the.}$ (Da)[b]**	**$M_{n,\ SEC/LS}$ (Da)[c]**	***Đ*** **(-)[c]**
0	0	-	-	-
1	40	8,200	8,500	1.03
2	49	10,000	10,500	1.04
3	55	11,200	11,100	1.04
4	60	12,200	12,000	1.03
5	64	13,000	13,600	1.02
6	65	13,200	13,900	1.02

[a] conversion values were calculated from ^{1}H NMR analysis.; [b] theoretical molecular weights were calculated according to this formula: $M_{n,the.}$ = DP × conv. × $MW_{monomer}$ + $MW_{RAFT\ agent}$.; [c] experimental molecular weight and dispersity values were obtained from LS analysis coupled with SEC.

- ***Temporal control of Fenton-RAFT polymerization***

Table S2. Characterization data of the synthesized PDMAs within the temporal control of Fenton-RAFT polymerization with [Fe(II)-MOF@Fe_3O_4] = 1.6 mg mL^{-1} and $[H_2O_2]_0$ = 35 mM.

Time (h)	**Conversion (%)[a]**	**$M_{n,the.}$ (Da)[b]**	**$M_{n,\ SEC/LS}$ (Da)[c]**	***Đ*** **(-)[c]**
0	0	-	-	-
1	45	9,200	9,400	1.05
2	45	9,200	9,350	1.05
3	51	10,400	10,350	1.04
4	51	10,400	10,450	1.04
5	59	12,000	11,900	1.03
6	59	12,000	11,950	1.03
7	66	13,350	13,600	1.03

[a] conversion values were calculated from ^{1}H NMR analysis.; [b] theoretical molecular weights were calculated according to this formula: $M_{n,the.}$ = DP × conv. × $MW_{monomer}$ + $MW_{RAFT\ agent}$.; [c] experimental molecular weight and dispersity values were obtained from LS analysis coupled with SEC.