Electronic Supplementary Information (ESI)

A novel dual-capability naphthalimide based fluorescent probe for Fe^{3+} ions detection and lysosomal tracking in living cells

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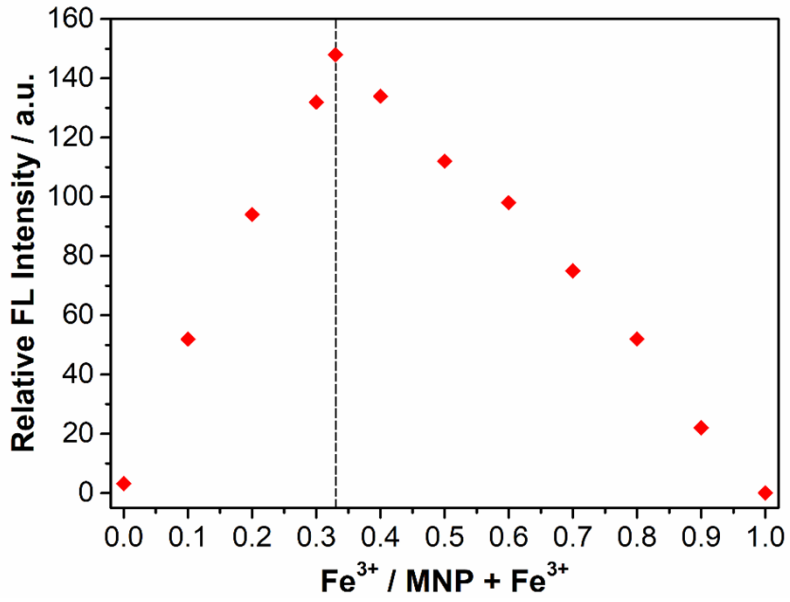

Figure S1 Job's plot of probe **MNP** in 10 mM HEPES buffer (pH 7.4; EtOH: H_2O = 5%; v/v). The total concentration of probe **MNP** and Fe^{3+} ions is 100 μM.

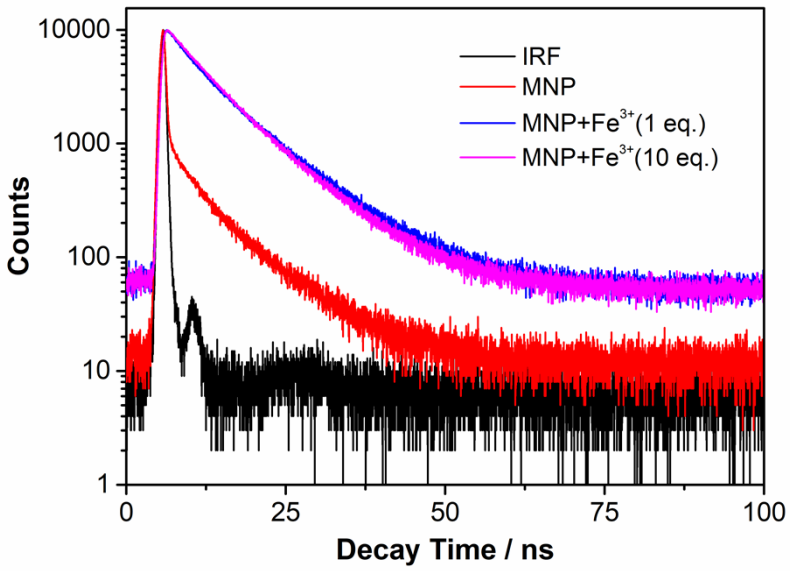

Figure S2 Fluorescence decay profiles of the **MNP** with Fe^{3+} ions. The average lifetime of the **MNP** is too short to fit. The average lifetime of the **MNP** with 1 eq. Fe^{3+} ions is 8.77 ns and contains two lifetime components: 3.55 ns (~24.2%) and 9.40 ns (~75.8%). The average lifetime of probe **MNP** with 10 eq. Fe^{3+} ions is 8.11 ns and contains two lifetime components: 4.61 ns (~30.97%) and 8.92 ns (~69.03%) (delay time at 510 nm emission). The fluorescence decay curves determined at the excitation of 405 nm, and the average lifetime was calculated

according to $\bar{\tau} = \frac{\sum_{i=1}^{n} \alpha_i \tau_i^2}{\sum_{i=1}^{n} \alpha_i \tau_i}$.

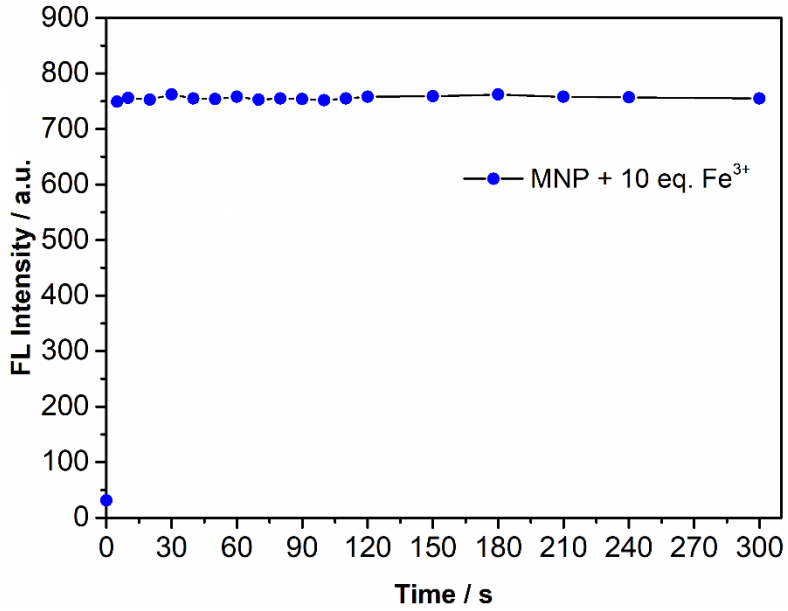

Figure S3 Time-dependent fluorescence intensity changes curve of the **MNP** (10 μM) in the present of 100 μM Fe^{3+} ions in 10 mM HEPES buffer (pH 7.4; EtOH: H_2O = 5%; v/v) (ex = 405 nm).

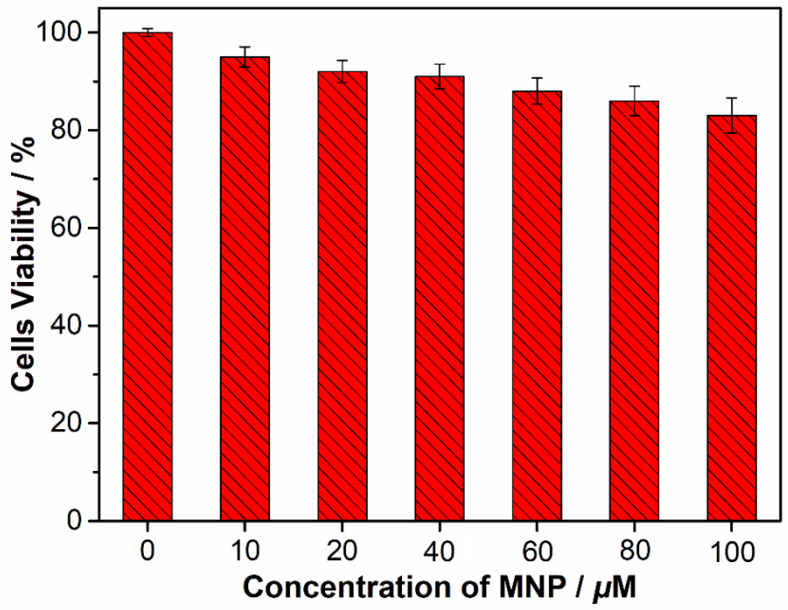

Figure S4 Effects of the **MNP** at varied concentrations on the viability of Hela cells. The cell viability data were checked five times.

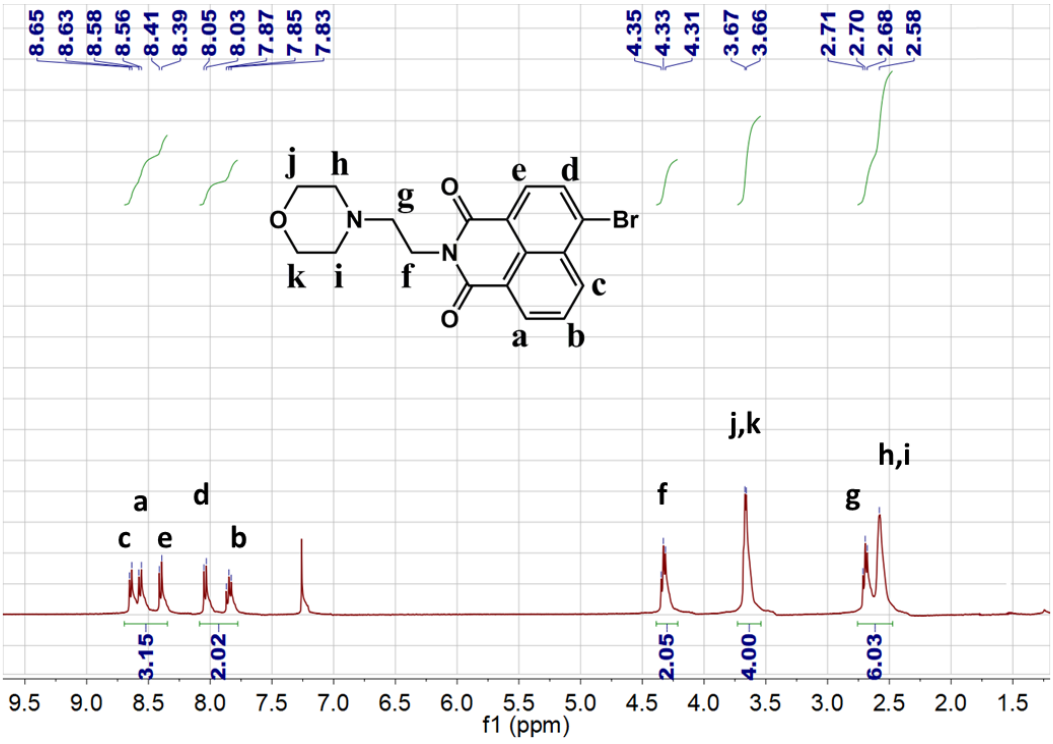

Figure S5 ^{1}H NMR ($CDCl_3$, 400 MHz) spectrum of the **MN**.

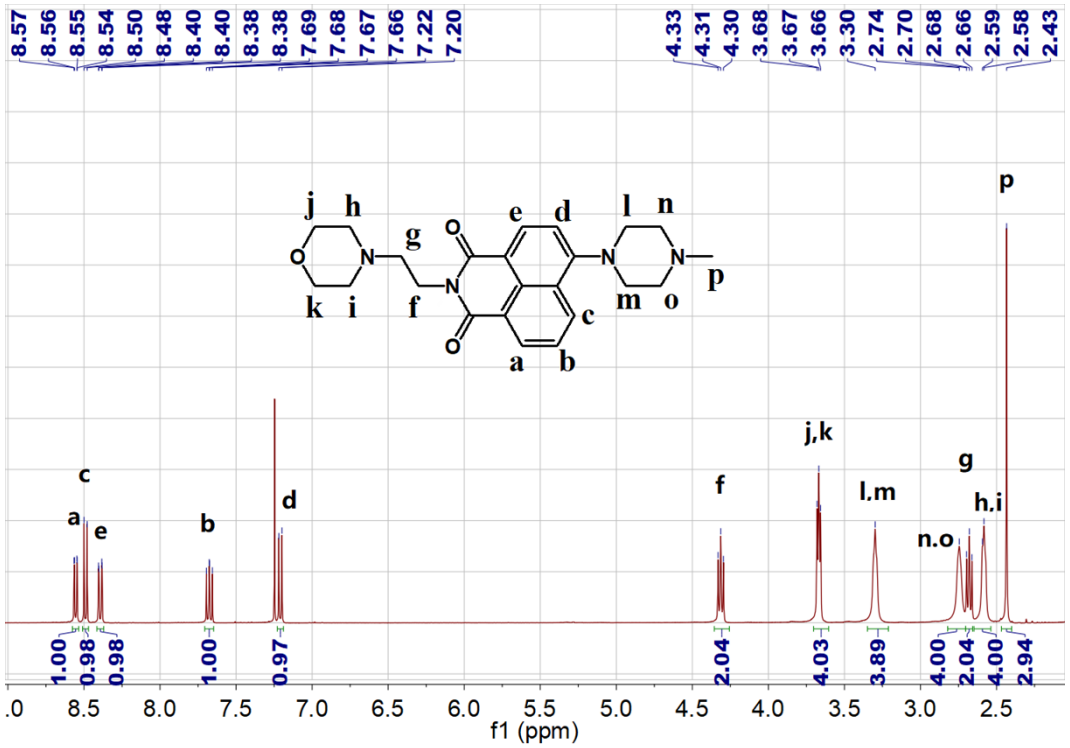

Figure S6 ^{1}H NMR ($CDCl_3$, 400 MHz) spectrum of the **MNP**.

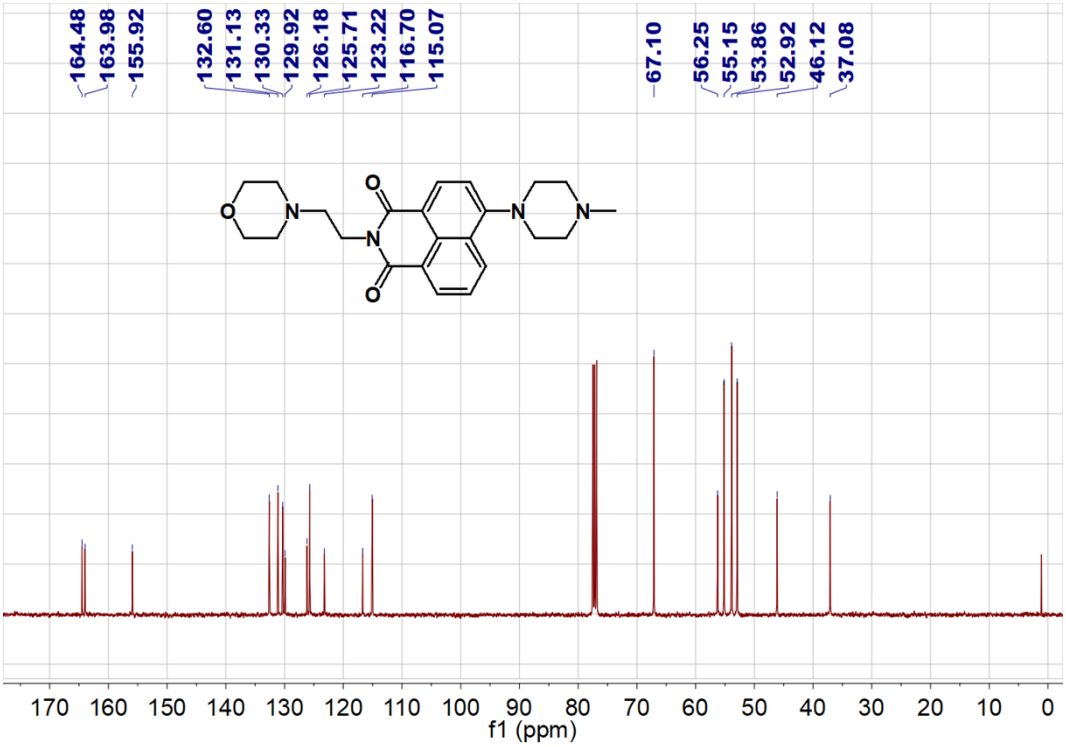

Figure S7 ^{13}C NMR ($CDCl_3$, 400 MHz) spectrum of the **MNP**.

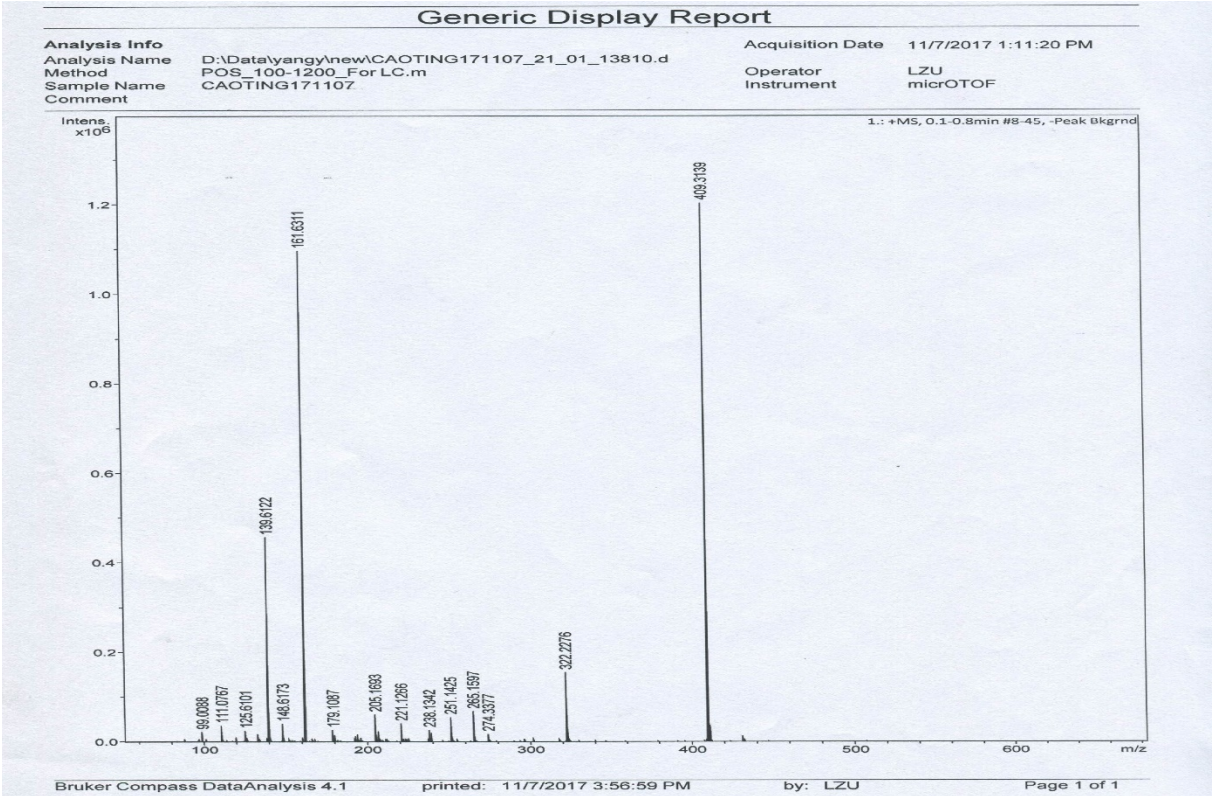

Figure S8 MS Spectrum of the **MNP**, calcd for ($C_{23}H_{28}N_4O_3$) $[M+H]^+$ 409.2161, found 409.3139.

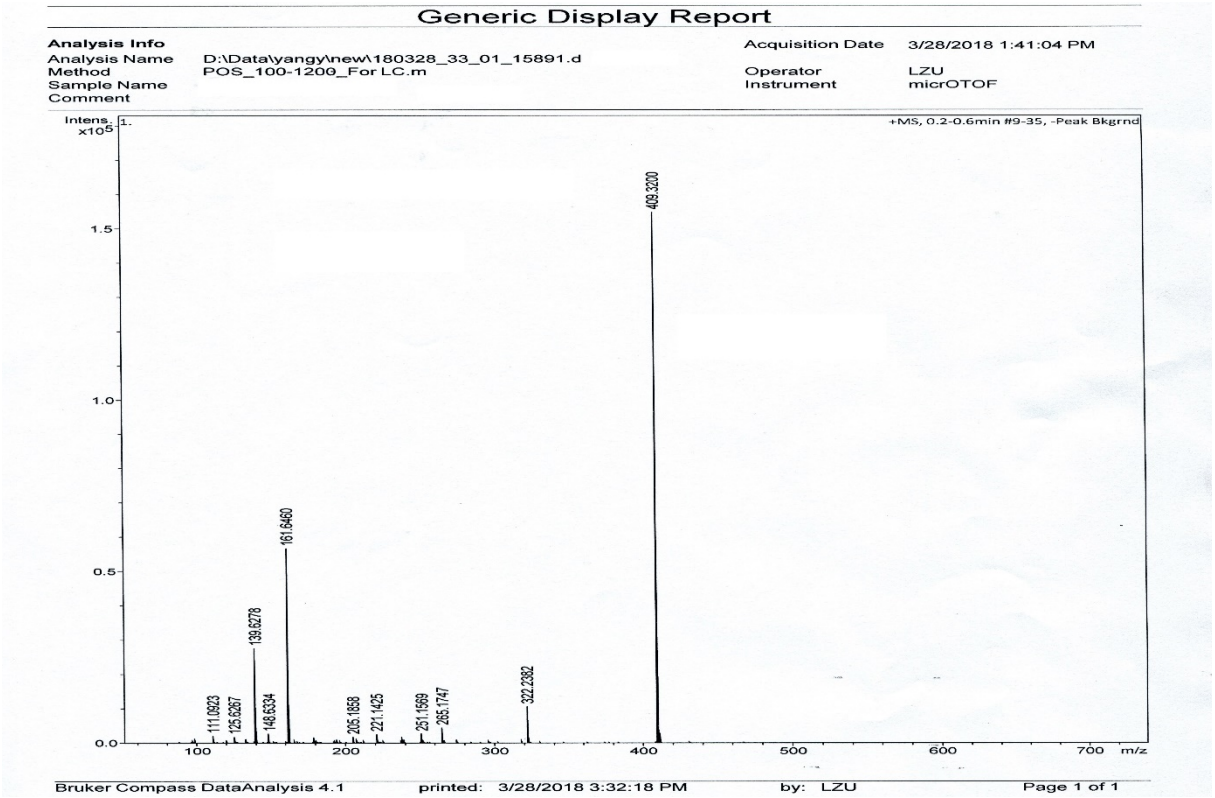

Figure S9 MS Spectrum of the **MNP**+HCl (1 eq.).

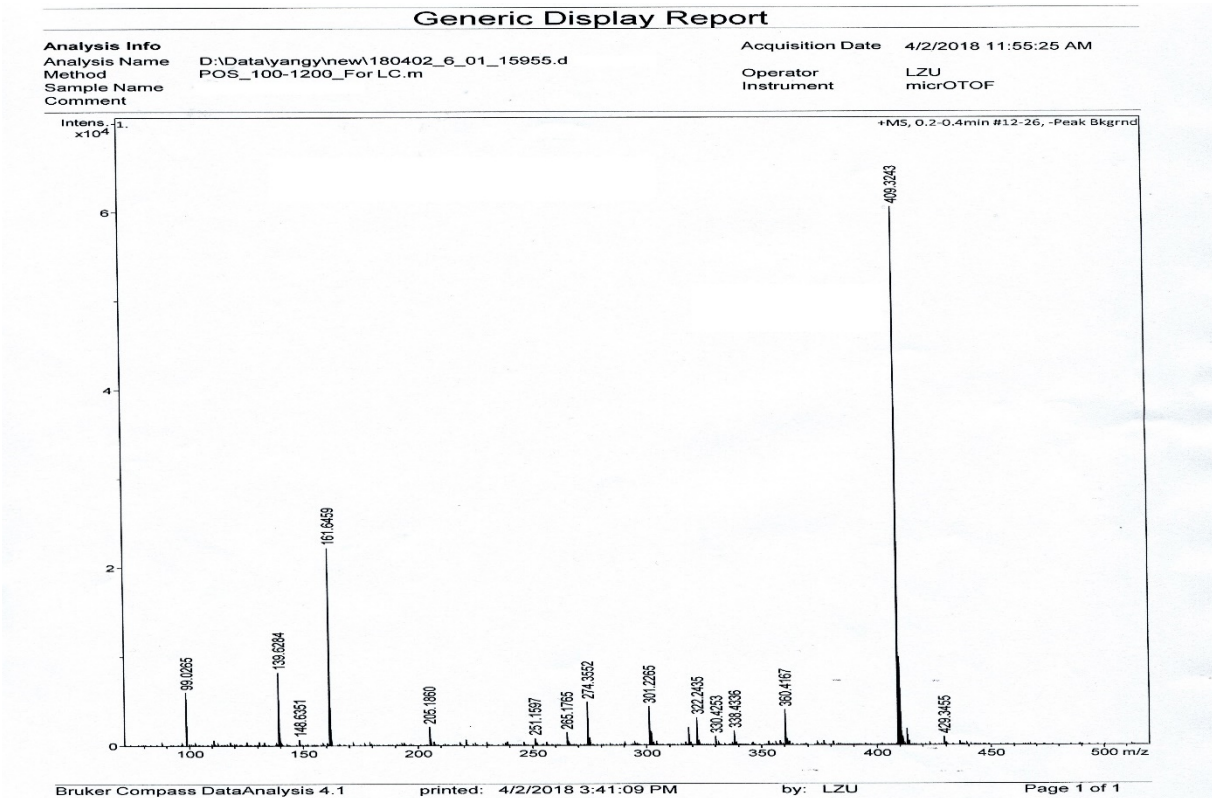

Figure S10 MS Spectrum of the **MNP**+Fe^{3+} (10 eq.).

Table S1 Determination results of the **MNP** in tap water samples.

Added / μM	**Detection / μM**	**Recovery / %**	**RSD / n = 3, %**
2	2.27 ± 0.29	113.5	0.52
4	4.30 ± 0.26	107.6	0.57
8	8.38 ± 0.34	104.8	0.37
12	13.31 ± 0.32	101.9	0.42
20	19.68 ± 0.38	98.4	0.44

Table S2 Determination results of the **MNP** in river water samples.

Added / μM	**Detection / μM**	**Recovery / %**	**RSD / n = 3, %**
2	2.19 ± 0.33	109.3	0.51
4	4.23 ± 0.29	106.4	0.49
8	8.22 ± 0.35	102.7	0.42
12	11.87 ± 0.36	98.9	0.38
20	19.34 ± 0.47	96.7	0.46