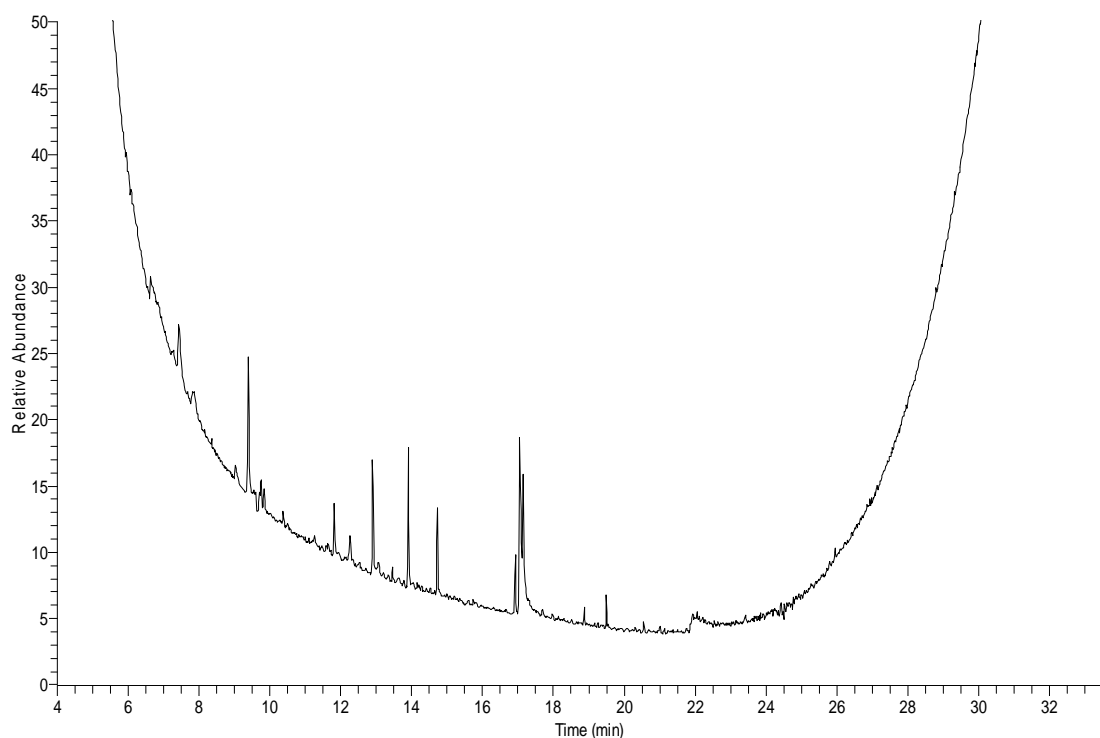


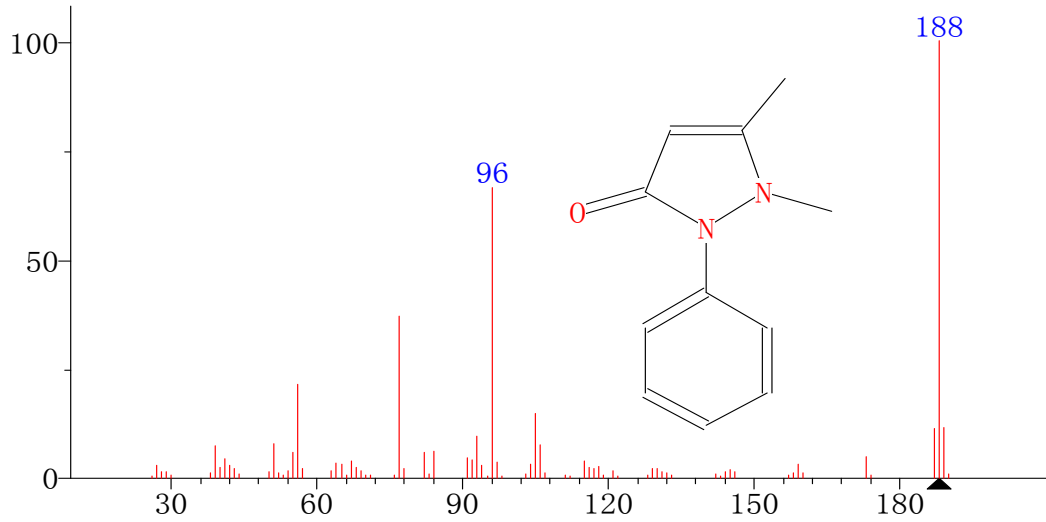
## Supporting materials

### Degradation pathways of antipyrine in the heterogeneous Fenton-like process

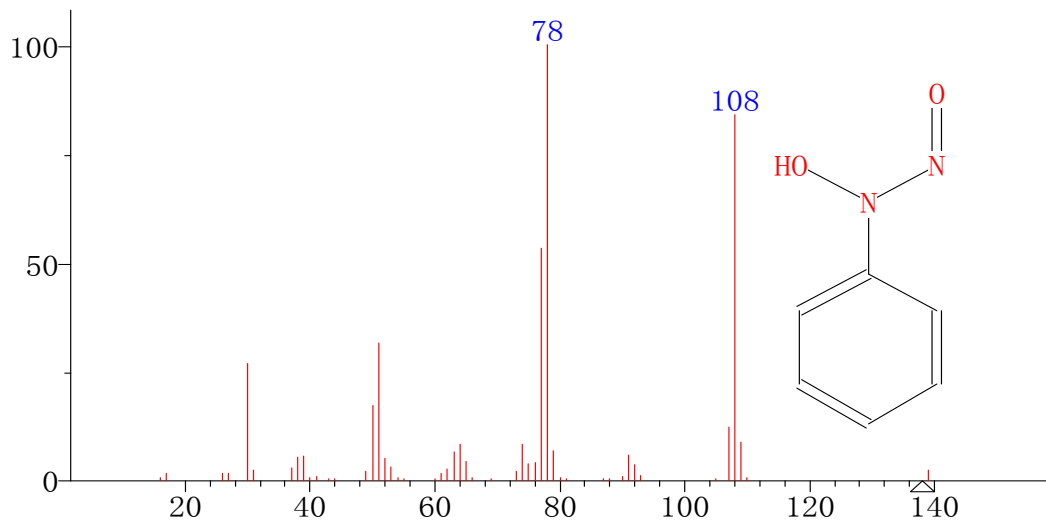
Intermediates in the antipyrine degradation were identified with the GC-MS chromatogram (Fig. S1). According to the retention time, molecular weight, and matching degree of chemical structure in the GC-MS results, the following dominant intermediates were identified: n-nitroso-n-phenylhydroxylamine ( $C_6H_6N_2O_2$ ), acetophenone ( $C_8H_8O$ ), benzonitrile ( $C_7H_5N$ ), aniline ( $C_6H_7N$ ), hexanedioic acid ( $C_6H_{10}O_4$ ), and 2,3-butanediol ( $C_4H_{10}O_2$ ).



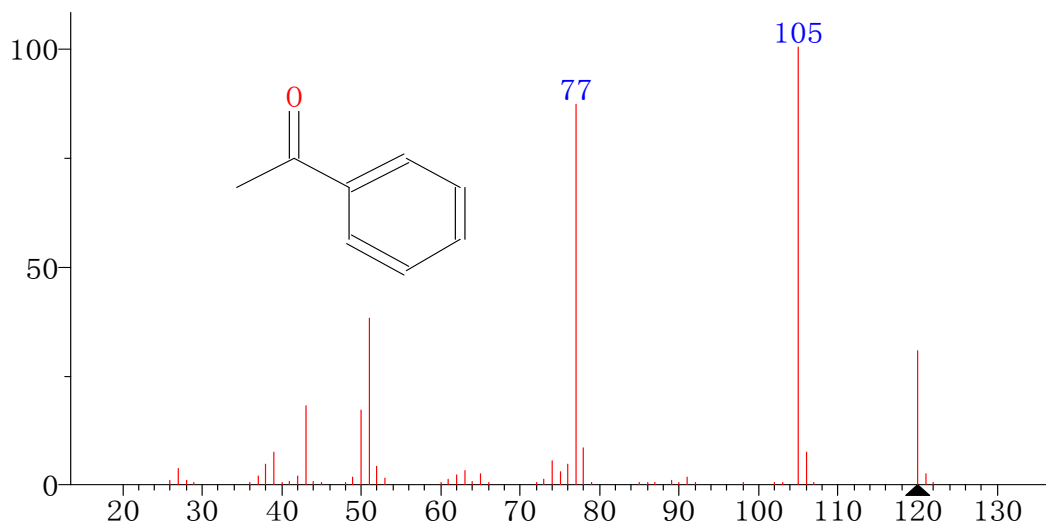
(a)



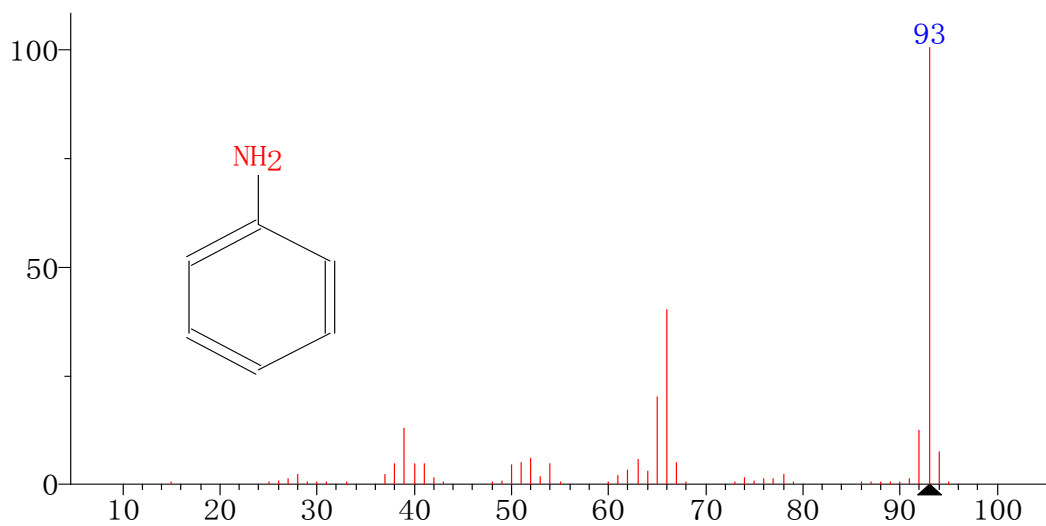
(b)



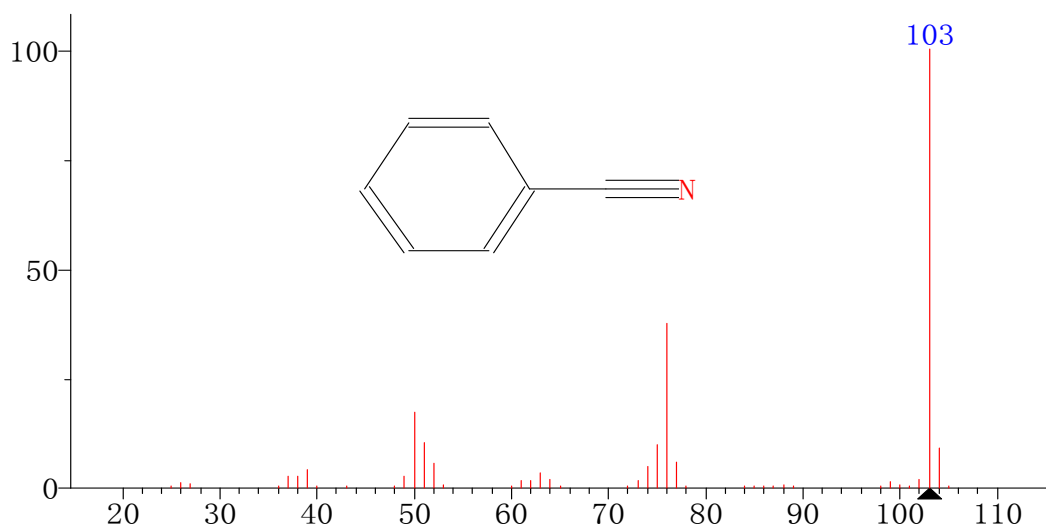
(c)



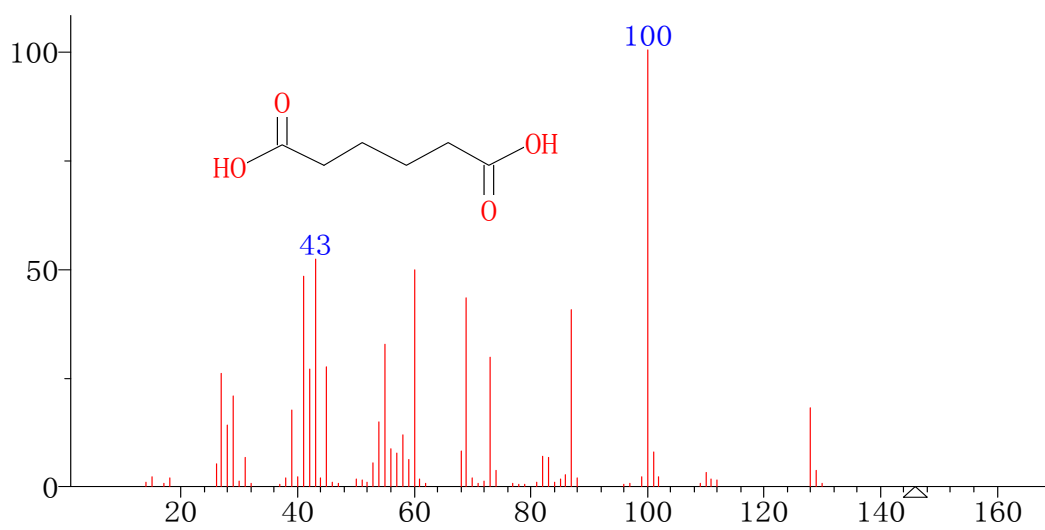
(d)



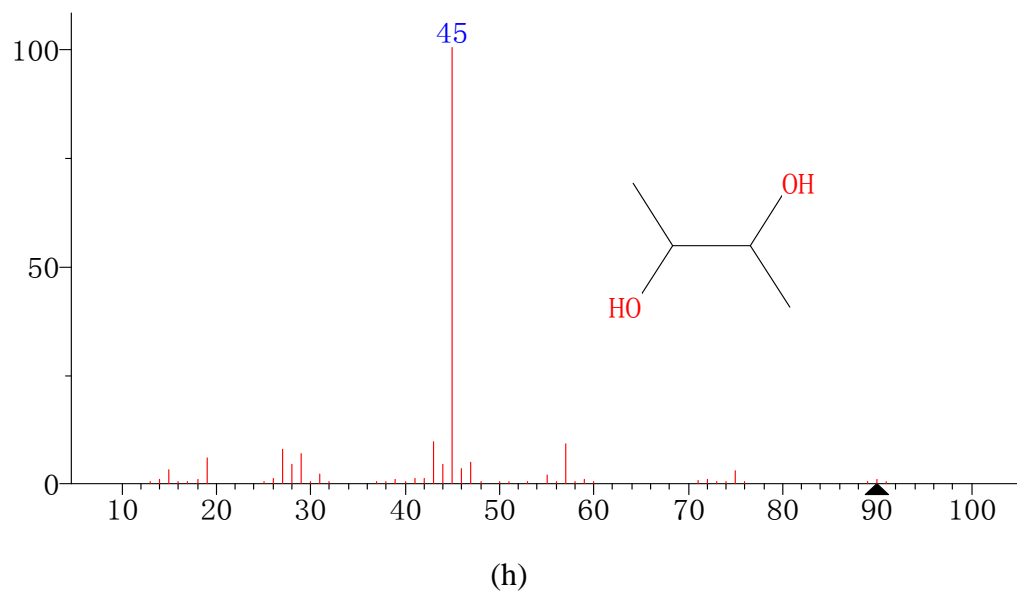
(e)



(f)



(g)



**Fig. S1** (a) The GC-MS analysis on the intermediates in the antipyrine degradation; MS spectra of (b) antipyrine ( $C_{12}H_{12}N_2O$ ); (c) N-nitroso-n- phenylhydroxylamine ( $C_6H_6N_2O_2$ ); (d) acetophenone ( $C_8H_8O$ ); (e) aniline ( $C_6H_7N$ ); (f) benzonitrile ( $C_7H_5N$ ); (g) Hexanedioic acid ( $C_6H_{10}O_4$ ); (h) 2,3-butanediol ( $C_4H_{10}O_2$ )