Supporting information

Exploring the fate and chemical transformation of organics by UV/H_2O_2-GAC and UV/H_2O_2-BAC based on pilot-scale systems in the treatment of micro-polluted surface water

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Fig. S1 The UV/H_2O_2 advanced oxidation integrated pilot water purification system.

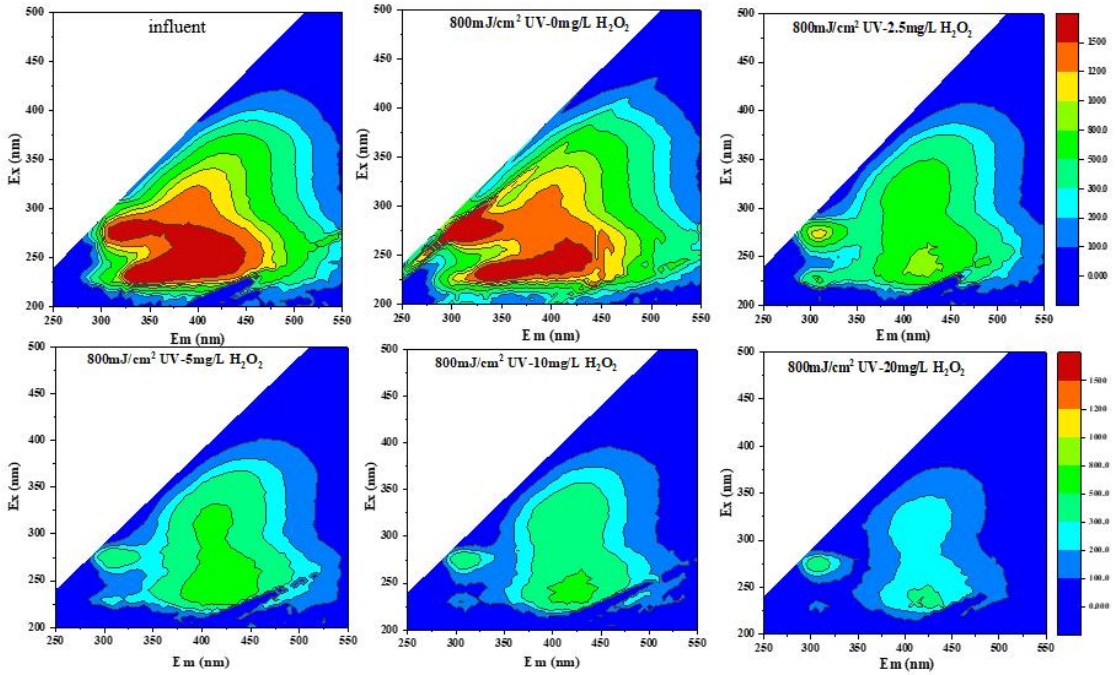

Fig. S2 EEM spectra of effluent with different hydrogen peroxide concentrations of UV/H_2O_2. Contours represent fluorescence intensity (a.u.).

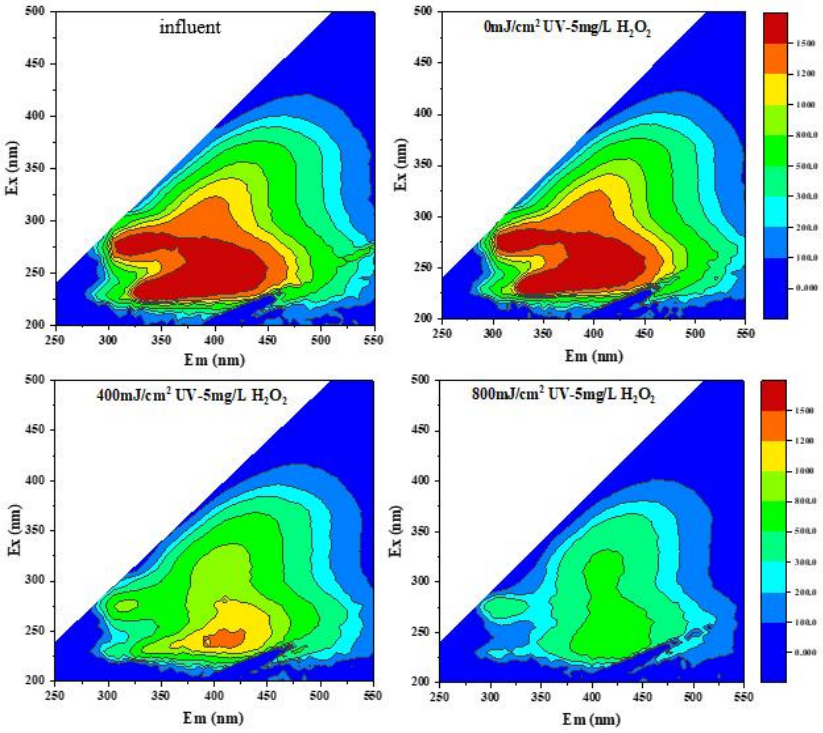

Fig. S3 EEM spectra of effluent with different UV dose. Contours represent fluorescence intensity (a.u.).

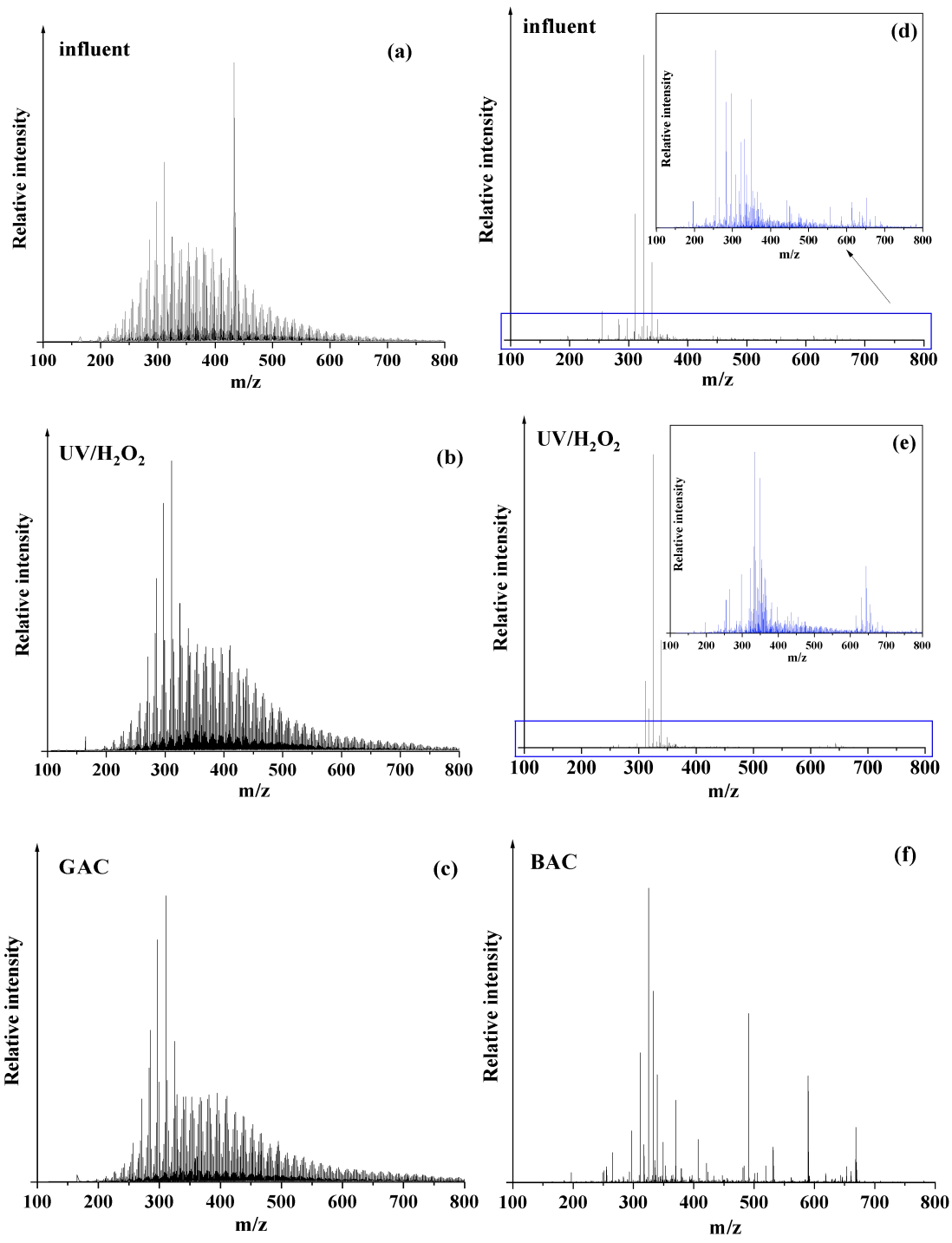

Fig. S4 FT-ICR MS mass spectra of (a)–(c): influent, UV/H_2O_2 and GAC; (d)–(f): influent, UV/H_2O_2 and BAC.

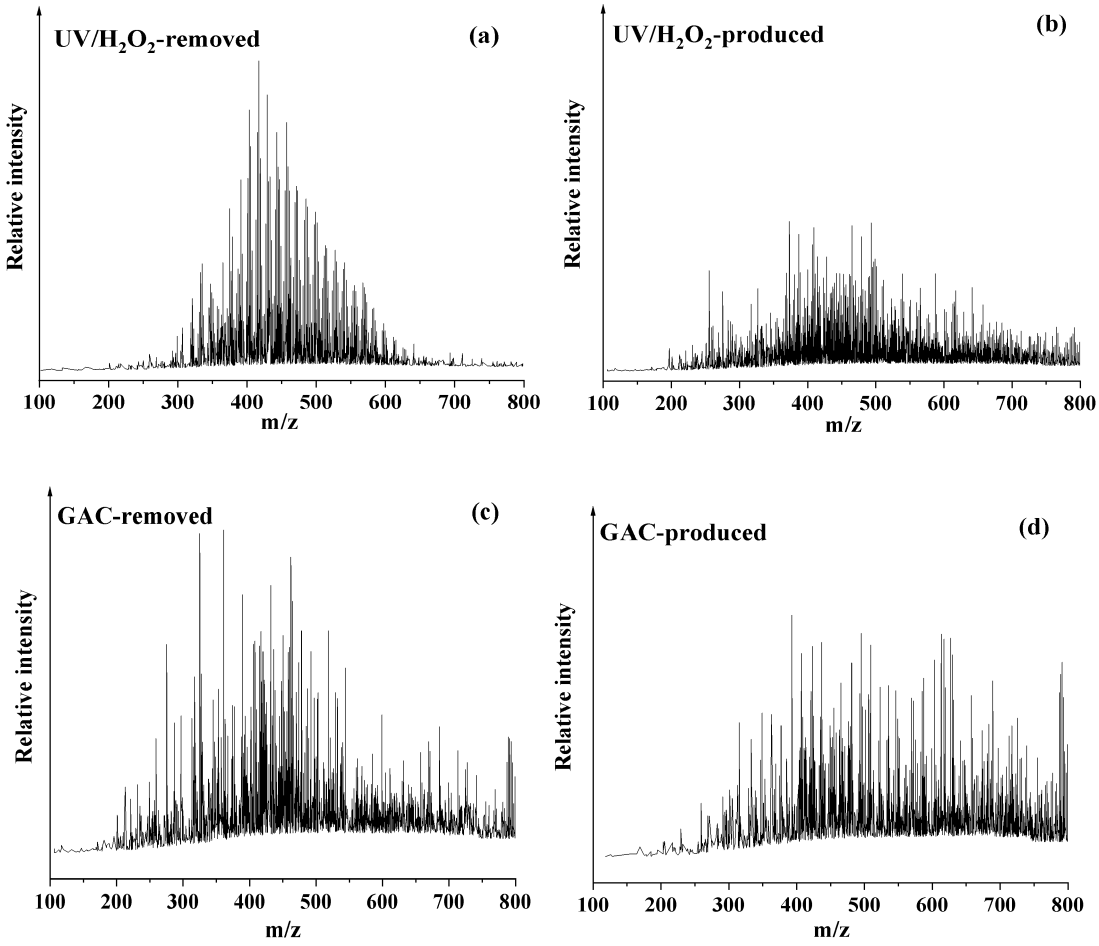

Fig. S5 FT-ICR MS mass spectra of (a) UV/H_2O_2-removed, (b) UV/H_2O_2-produced, (c) GAC-removed, (d) GAC-produced.

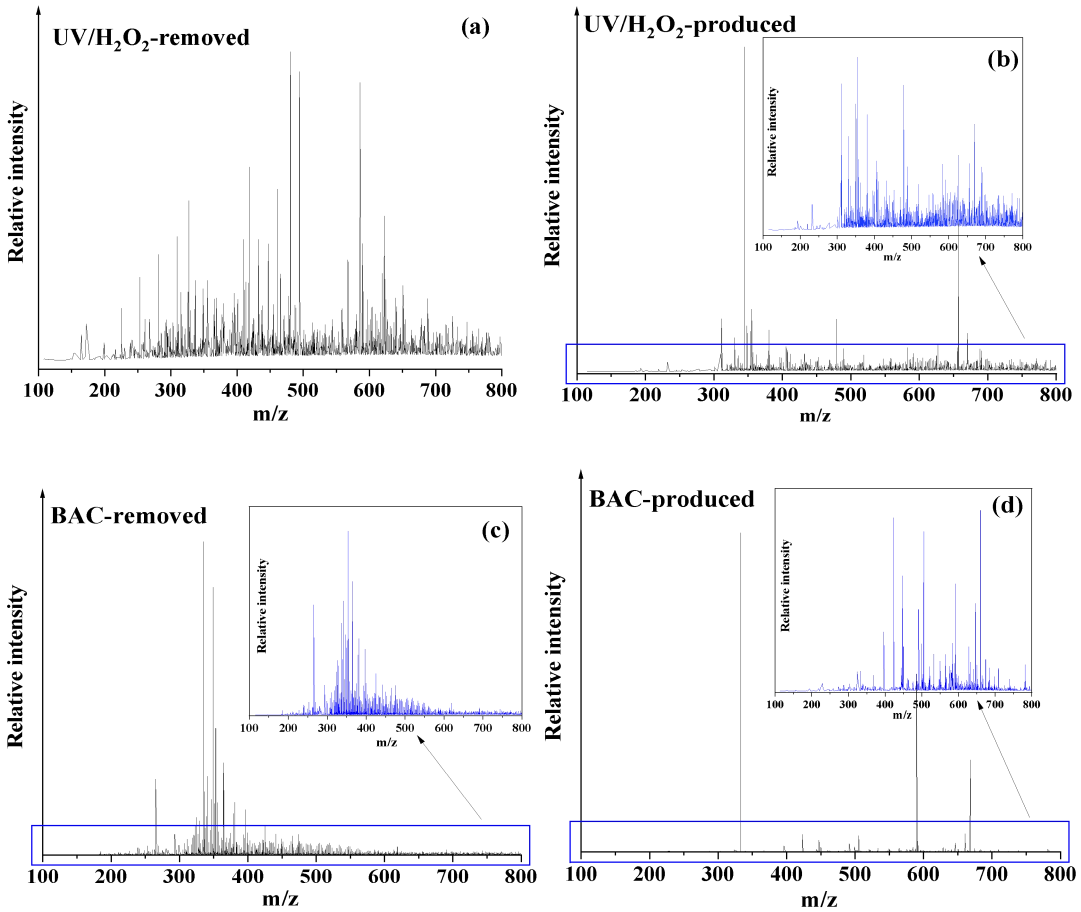

Fig. S6 FT-ICR mass spectra of (a) UV/H_2O_2-removed, (b) UV/H_2O_2-produced, (c) BAC-removed, (d) BAC-produced.

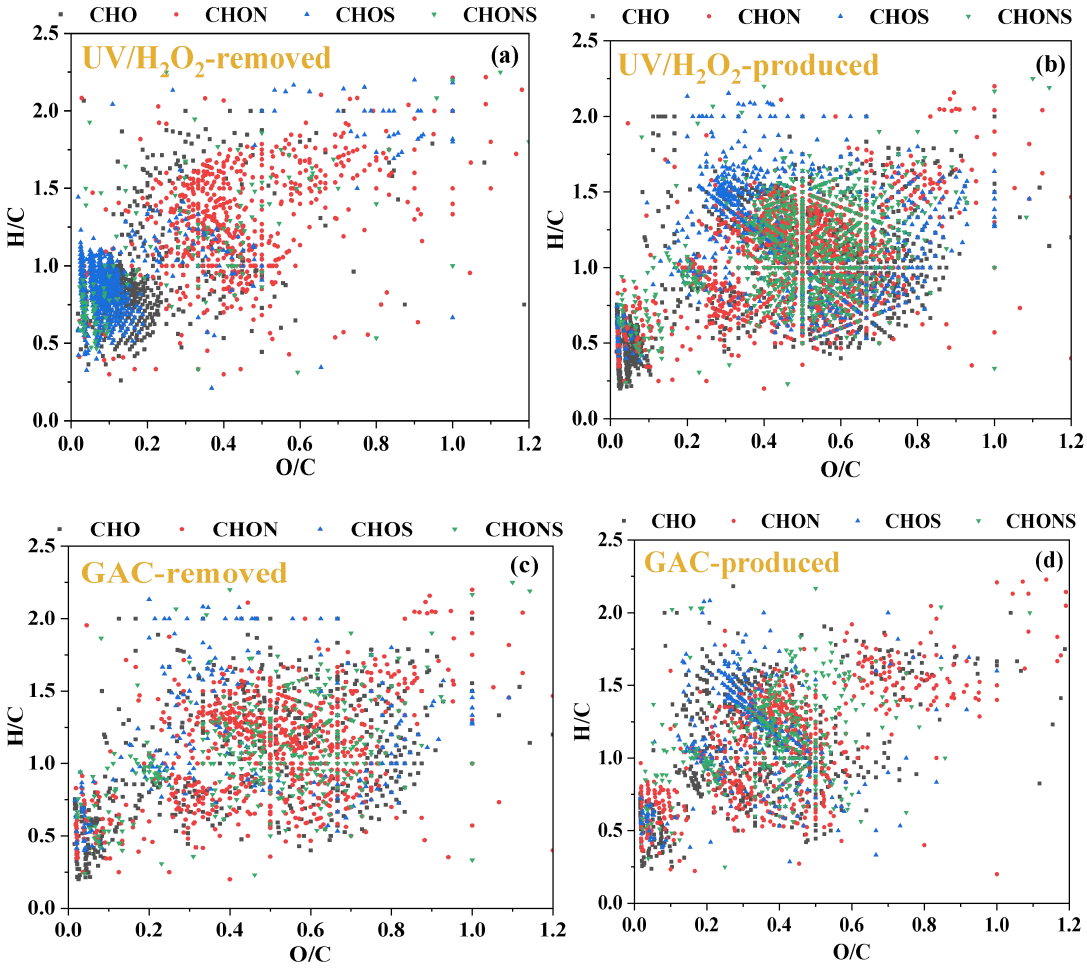

Fig. S7 Venn diagrams of H/C and O/C ratios of (a) UV/H_2O_2 removed, (b) UV/H_2O_2 produced, (c) GAC removed, (d) GAC produced under different reaction conditions. Each molecular formula with a given H/C and O/C ratio was categorized according to the CHO, CHOS, CHON, and CHONS compounds.

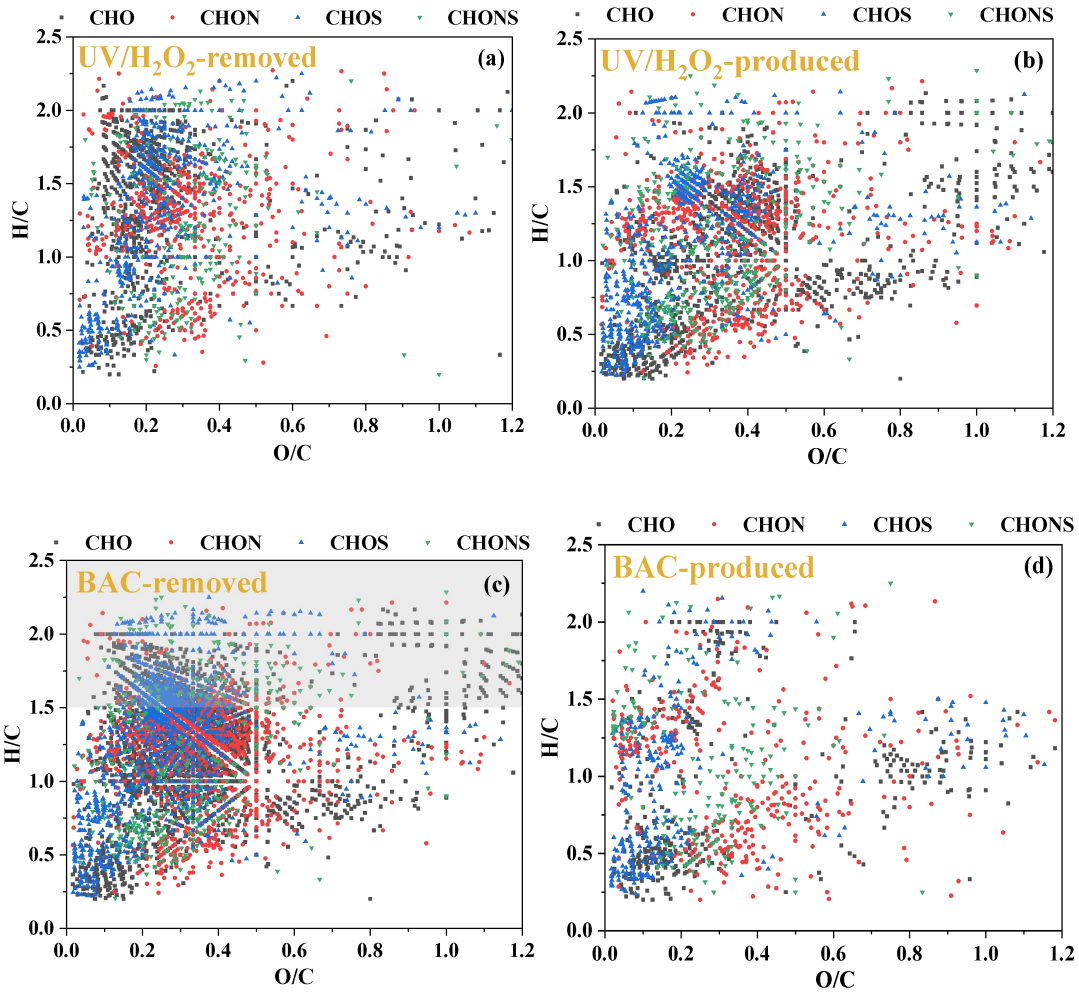

Fig. S8 Venn diagrams of H/C and O/C ratios of (a) UV/H_2O_2 removed, (b) UV/H_2O_2 produced, (c) BAC removed, (d) BAC produced under different reaction conditions. Each molecular formula with a given H/C and O/C ratio was categorized according to the CHO, CHOS, CHON, and CHONS compounds.

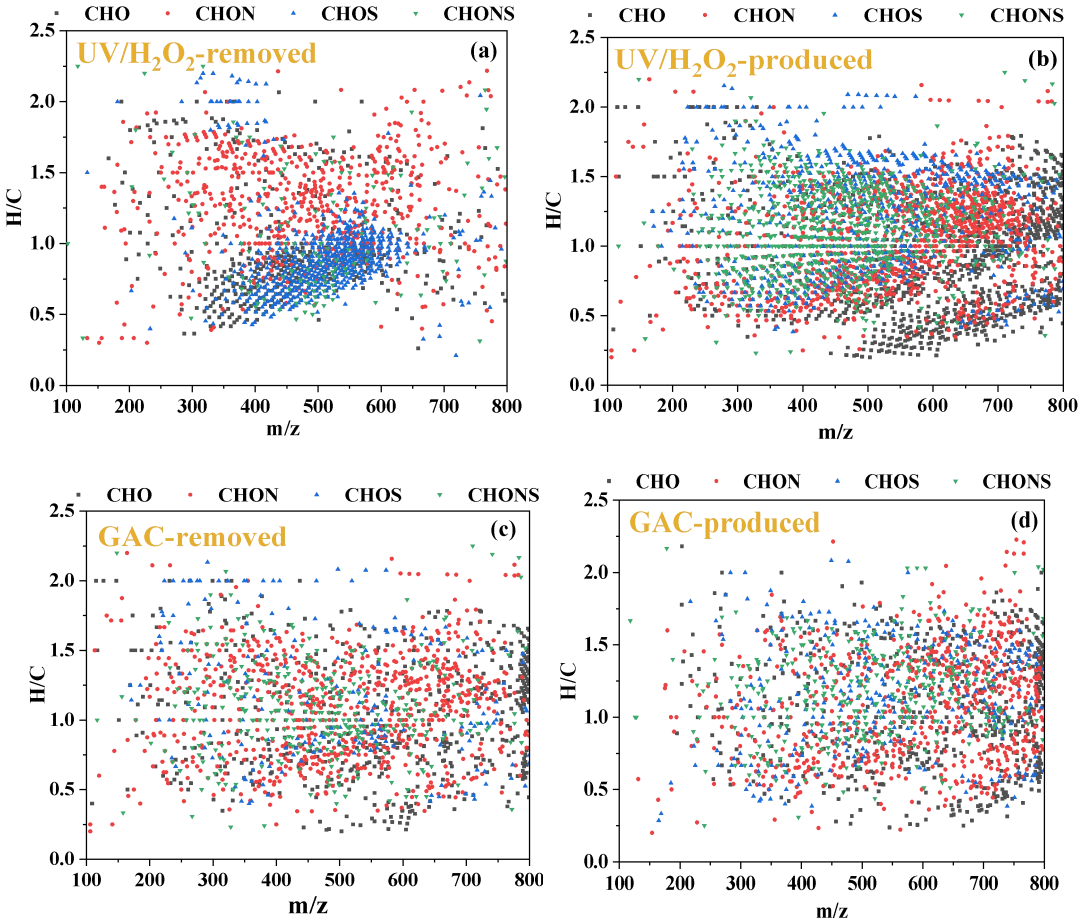

Fig. S9 Mass edited H/C ratios of (a) UV/H_2O_2 removed, (b) UV/H_2O_2 produced, (c) GAC removed, (d) GAC produced under different reaction conditions. Each molecular formula was categorized according to the CHO, CHOS, CHON, and CHONS compounds.

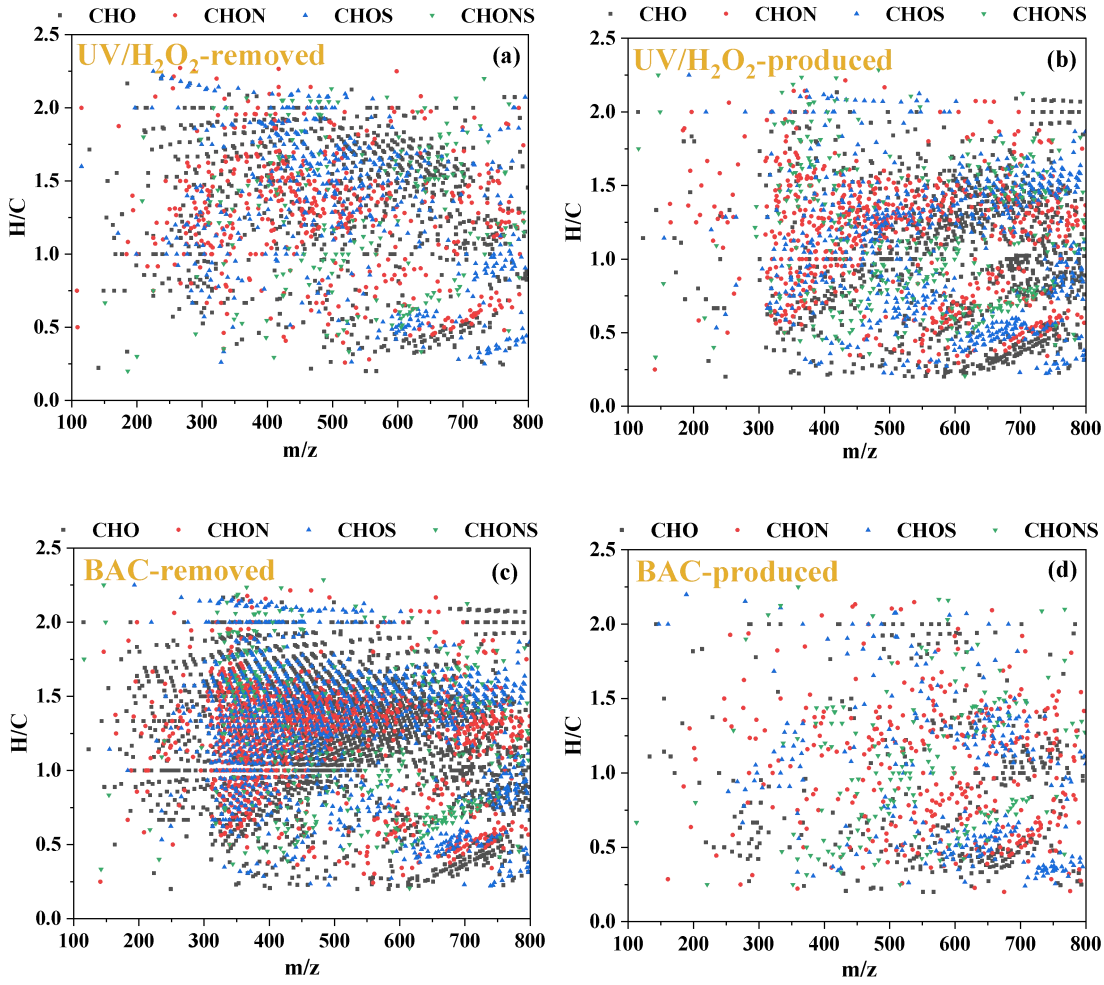

Fig. S10 Mass edited H/C ratios of (a) UV/H_2O_2 removed, (b) UV/H_2O_2 produced, (c) BAC removed, (d) BAC produced under different reaction conditions. Each molecular formula was categorized according to the CHO, CHOS, CHON, and CHONS compounds.

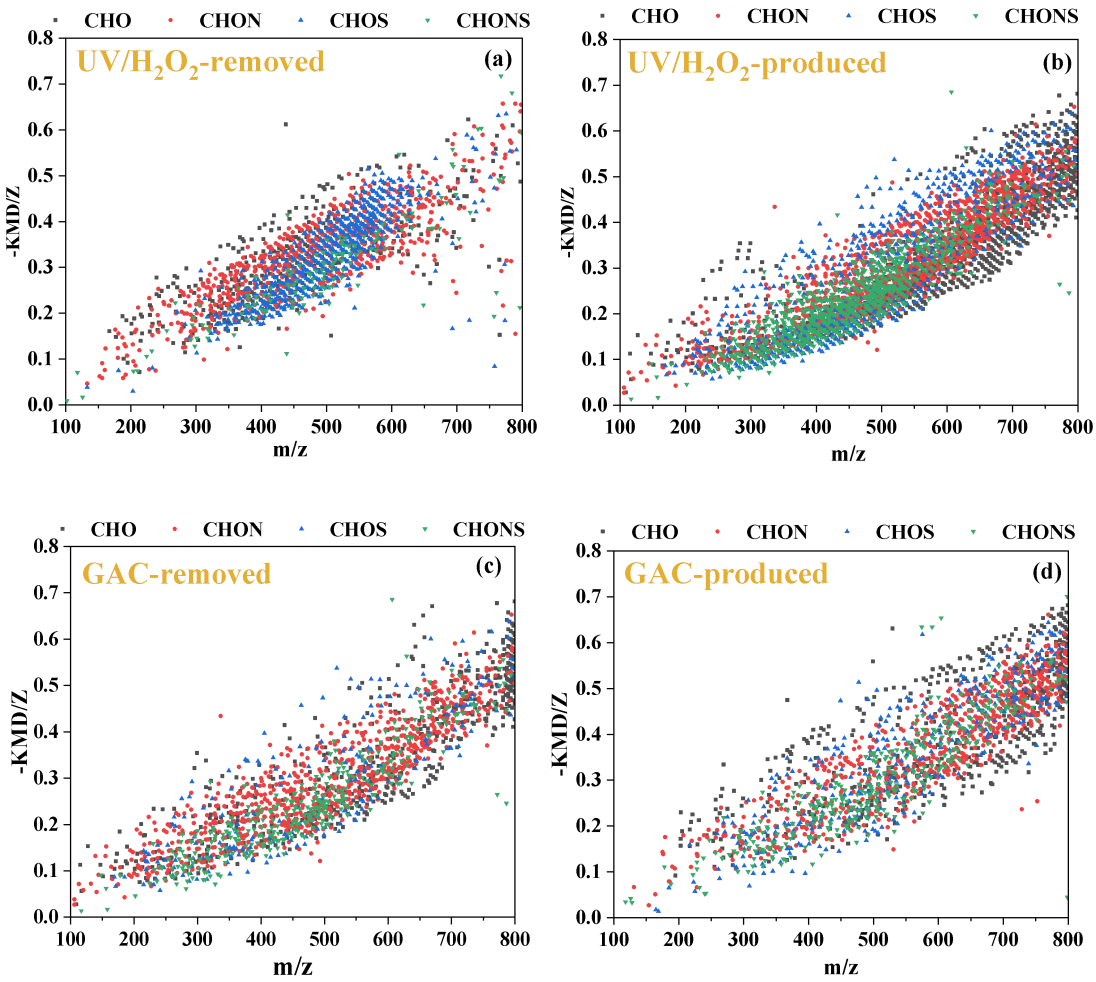

Fig. S11 Modified Kendrick mass plots (a) UV/H_2O_2 removed, (b) UV/H_2O_2 produced, (c) GAC removed, (d) GAC produced under different reaction conditions. Each molecular formula was categorized according to the CHO, CHOS, CHON, and CHONS compounds.

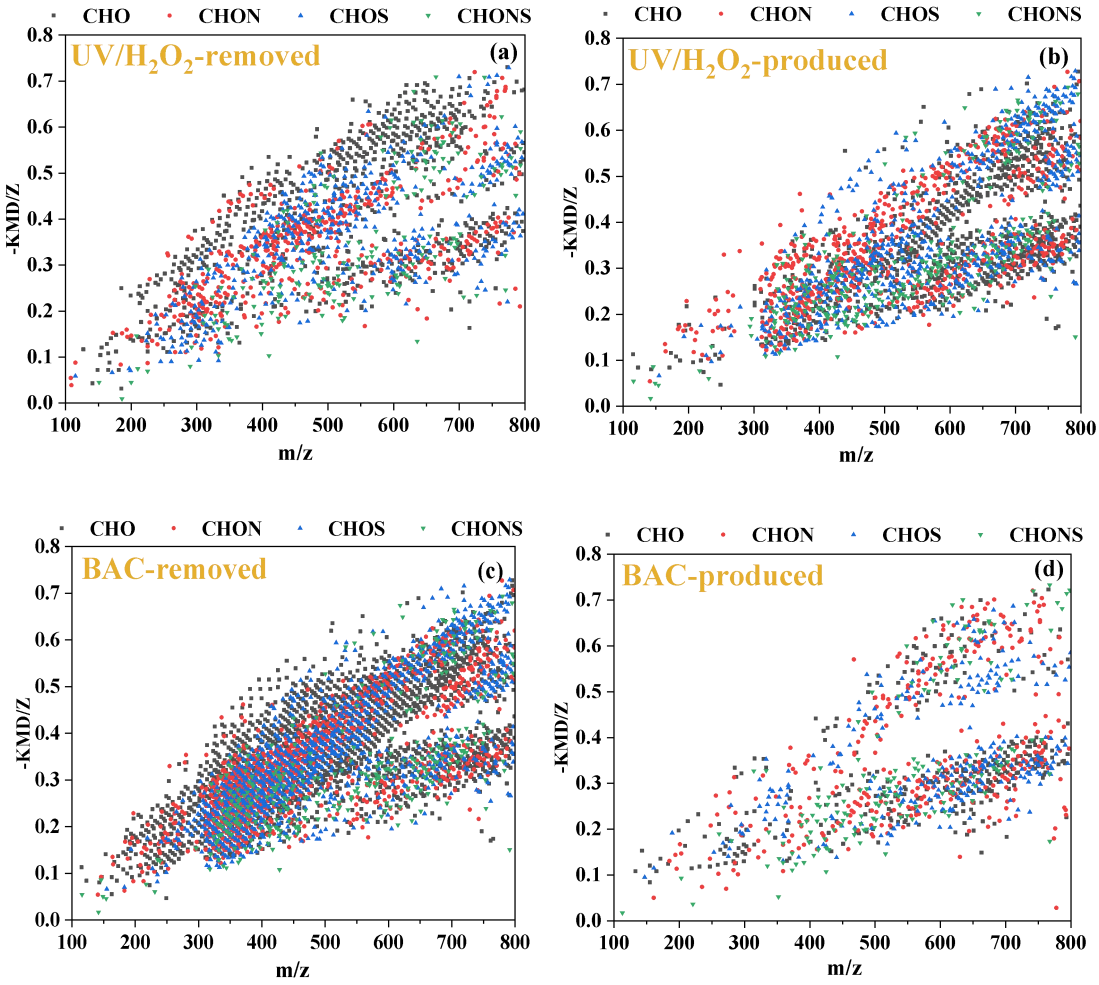

Fig. S12 Modified Kendrick mass plots of (a) UV/H_2O_2 removed, (b) UV/H_2O_2 produced, (c) BAC removed, (d) BAC produced under different reaction conditions. Each molecular formula was categorized according to the CHO, CHOS, CHON, and CHONS compounds.

Table S1 The EBCT, where the residual H_2O_2 is extracted to zero by GAC and BAC.

Process	Test 1	Test 2	Test 3	Average
GAC	7.91 min	8.04 min	7.97 min	7.97 min (±0.053 min)
BAC	9.68 min	9.74 min	9.78 min	9.73 min (±0.041 min)