Supplementary data

Text S1. Toxicity testing methods

(1) Acute toxicity

The acute toxicities of water samples were detected with a DeltaTox II luminometer (SDIX, USA), a commercial bioassay according to the ISO standard based on the inhibition of bioluminescence emitted by the luminescent bacteria *V. fischeri*. The specific steps are as follows: Firstly, 310 μL of Micro Tox dilution was added to the luminescent bacteria freeze-dried test tube, which was evenly distributed into 3 test tubes after being cultured for 15 min at room temperature and the initial luminosity (E_0) was recorded using the physiological fluid as a blank control. Then, 100 μL of Micro Tox osmotic adjustment solution (OAS) was taken into 1000 μL of water sample to be tested and shaken until uniform to adjust the salinity of the water sample to 3%. Finally, 900 μL of the above water sample was added into the corresponding sequence of luminescent bacteria tubes. The luminosity (*E*) of the water sample was recorded after 5 min of exposure. The pH of the water sample was adjusted to neutral before the test and the test temperature was controlled at 20±5 °C. The 15 min EC50 of the quality control reference poison $HgCl_2$ to the luminescent bacteria was 0.08~0.12 mg/L. The acute toxicity of the water sample was expressed by the relative luminosity inhibition rate (*T*%). The calculation formula was as shown in the following formula:

$$T\% = \frac{E_0 - E}{E_0} 100\%$$

Where E_0 and E represent the normalized bioluminescence intensities of the control and the water sample. The greater the value of *T*%, the higher the acute toxicity of the water sample.

(2) Chronic toxicity

The chronic toxicities of samples were detected by the standard method of *D. magna* 21 d chronic toxicity test following OECD guidelines. The maximum non-observed effect concentration (*NOEC*) was obtained to express the chronic toxicity effect. The specific steps are as follows. Firstly, the pre-test was carried out, through which the water sample was diluted to different concentration gradients and 2~3 parallels was set for each concentration. The 400 mL crystallized dish was used and equipped with 250~300 mL test solution and 10 *D. magna*. Each test liquid was set up with a blank control containing an equal volume of dilution water. The mortality of *D. magna* for each container was recorded after 24 hours of the test, which taken the heartbeat stop of *D. magna* as the end point of the test. According to the result of the pre-test, the 24 h half lethal concentration LC50 of water sample to *D. magna* was obtained. Then, 4~5 concentration gradients were set in the range of 0.01~0.5 times LC50 water sample concentration, and 10 parallels were set for each concentration. The aerated dechlorination tap water was used as the blank control. 1 *D. magna* was put in the 25 mL water sample or tap water, and was cultured for 21 days in an incubator with a light to dark ratio of 16:8 and 25 °C. Feed water every two days and record the survival of *D. magna* every day. At the end of the trial, the mortality of *D. magna* in the blank control was not more than 10% as effective. In the 21 d culture process, the maximum non-effect concentration NOEC of the water sample in the test group for *D. magna* was obtained as compared with the control group. The chronic toxicity equivalent of the water sample to *D. magna* was obtained according to the calculation formula $TU=100\%/NOEC$.

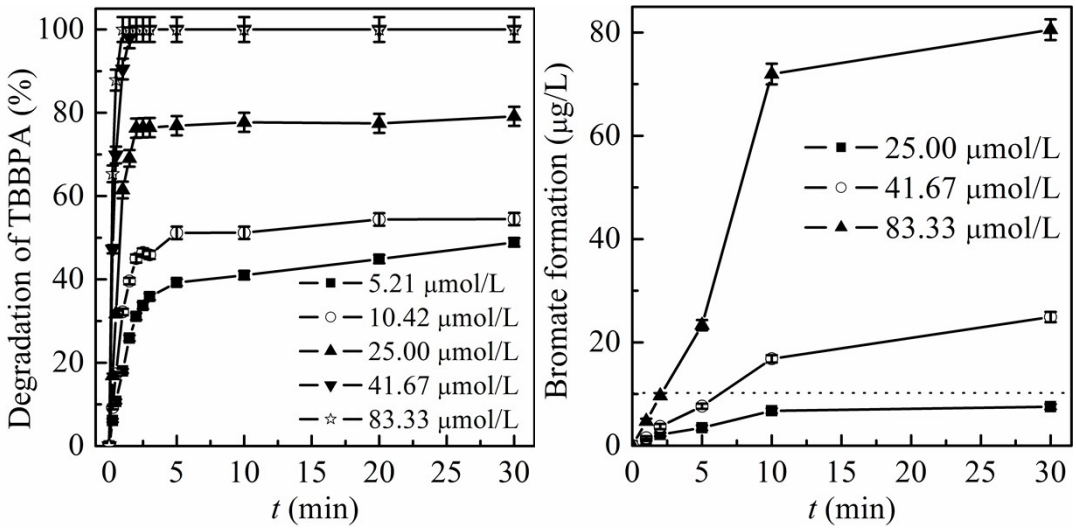

Fig. S1. Degradation of TBBPA by sole ozonation and bromate formation. (Experimental conditions: ozone dosage= 5.21, 10.42, 25.00, 41.67, 83.33 μmol/L; $[TBBPA]_0$= 1.84 μmol/L; initial pH= 7.0; temperature= 25 °C.)

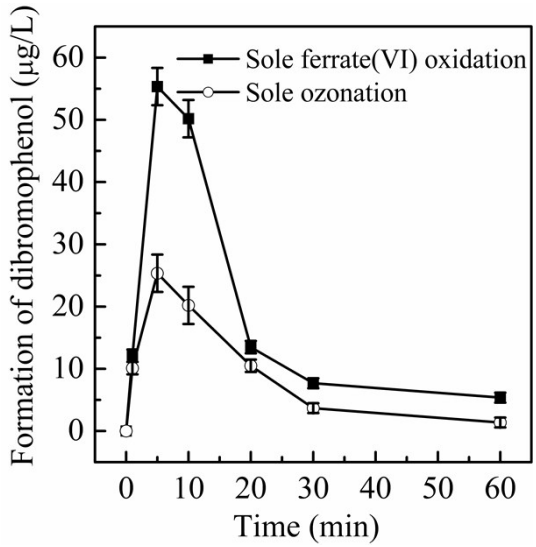

Fig. S2. Formation of dibromophenol 4 during degradation of TBBPA (Experimental conditions: TBBPA concentration= 1.84 μmol/L; ferrate(VI) concentration= 0.51 μmol/L; ozone concentration= 0.51 μmol/L; initial solution pH= 7.0; temperature= 25±0.5 °C)