Abatement of Epinastine by UV/Chlorine and Formation of DBPs during Post-chlorination: Concentration-dependent Effects of Chlorine and Bromide

抗ヒスタミン薬エピナスチンの紫外線塩素促進酸化処理による分解 －塩素投与量と臭化物イオン濃度が分解効率と消毒副生成物生成能に与える影響

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I am greatly honoured to be inducted into the JSWE-ORGANO Doctoral Research Award at the 27th JSWE Symposium. I appreciate for all the members of JSWE and ORGANO Corporation who organised this award. I also would like to express my heartfelt thanks to the supervisor Dr Hiroshi Sakai, his lab-members, and the department staffs of the university. He has always given me precious advises to develop me as a researcher and valuable opportunities to have connections with people in the water sectors.

This study elucidated ultraviolet-activated advanced oxidation processes (UV-AOPs) to abate a micropollutant and evaluated formation of disinfection byproducts (DBPs) during post-chlorination. Micropollutants are groups of anthropogenic chemical substances such as pharmaceuticals and pesticides. Previous studies concerned health-related issues of micropollutants contaminated in the water environment; moreover, some compounds are resistant to general water treatments. That is, we are seeking for possibilities of UV-AOPs as an alternative; however, radical-induced reactions are always apprehended due to formation of unknown transforming products. This study firstly compared three types of UV-AOPs (UV/hydrogen peroxide, UV/persulfate, and UV/chlorine) in a stoichiometrically equal condition, resulting in UV/chlorine outperformed the other two processes for the degradation efficiency of the micropollutant. Furthermore, this study demonstrated that formation potentials of selected DBPs were mitigated depending on chlorine dosage for the UV/chlorine treatment, suggesting that UV/chlorine can be optimised to sufficiently degrade micropollutants while controlling formation of toxic byproducts. As future implications, practical feasibility of UV/chlorine will be assessed in the coexistence of DOM surrogates.

Telling significance of a study is never easy, because we shall not see the same vision. However, we realise by winning an award that people recognise our efforts, encouraging me to work harder than ever. Lastly, I thank for being a part of this symposium. I believe all us finalists are the winners; I met new people and had profitable discussions. The important thing was learning something from these experiences; that was more memorable rather than being an awardee.