题目：新型有机氯胺活化工艺对水中新污染物的降解效能与机理

摘要：紫外（UV）/氯（胺）工艺是备受关注的去除水中新污染物的高级氧化工艺（AOPs）。然而在 UV/氯和 UV/氯胺工艺仍存在一些限制，这归因于自由基种类和产率的差异，导致无法有效去除特定污染物。本研究报告了 UV/二氯异氰尿酸钠（NaDCC）作为新型自由基源。NaDCC 被证明是一种在次氯酸和氯胺之间平衡的化合物，具有显著的 UV 吸收和量子产率。UV/NaDCC 产生了比传统 UV/氯（胺）更多的羟基自由基（•OH）和活性氯物质（RCSs，包括 Cl•，ClO•和 Cl_2•-），因此表现出更高的氧化效率。进一步探究了 UV/NaDCC 过程在新污染物去除方面的反应机制、环境适用性和能耗需求。结果显示，•OH 和•NH_2 主要通过氢原子转移（HAT）和自由基加合物形成来攻击新兴污染物（ECs），而 Cl•主要通过 HAT 和单电子转移来破坏 ECs，ClO•通过 HAT 发挥一定作用。动力学模型分析表明，在各种水质条件下，UV/NaDCC 相比传统的 UV/氯（胺）表现出更高的降解效率，每个阶段可显著节省高达 96%的电能。总体而言，本研究首次展示了 UV/NaDCC 作为新型 AOP 的应用前景，可以弥补传统的 UV/氯（胺）高级氧化工艺的不足

Title：Novel Organic Chloramine Activation Process for Water Decontamination : Efficiency and Mechanism

Abstract ： Ultraviolet (UV)/chlor(am)ine processes are emerging advanced oxidation processes (AOPs) for water decontamination and raising continuous attention. However, limitations appear in the UV/hypochlorite and UV/monochloramine for removing specific contaminants ascribed to the differences in the sorts and yields of free radicals. Here, this study reports UV/dichloroisocyanurate (NaDCC) as a novel source of radicals. NaDCC was demonstrated to be a well-balanced compound between hypochlorite and monochloramine, and had significant UV absorption and a medium intrinsic quantum yield. The UV/NaDCC produced more substantial hydroxyl radicals (•OH) and reactive chlorine species (RCSs, including Cl•, ClO• and Cl_2•$^-$) than conventional UV/chlor(am)ine, thereby performing higher oxidation efficiency. The reaction mechanisms, environmental applicability, and energy requirements of the UV/NaDCC process for emerging contaminants (ECs) abatement were further investigated. The results showed that •OH and •NH_2 attacked ECs mostly through hydrogen atom transfer (HAT) and radical adduct formation, whereas Cl• destructed ECs mainly through HAT and single electron transfer, with ClO• playing a certain role through HAT. Kinetic model analyses revealed that the UV/NaDCC outperformed the conventional UV/chlor(am)ine in a variety of water matrices with superior degradation efficiency, significantly saving up to 96% electrical energy per order. Overall, this study first demonstrates application prospects of a novel AOP using UV/NaDCC, which can compensate for deficiency of the conventional UV/chlor(am)ine AOPs.