

Supplementary Materials

Re-Examining Cyanuric Acid: An Overlooked Non-Halogenated Cyclic Disinfection Byproduct in Swimming Pool Water

Tian Qiu ^{1,†}, Zhuorong Du ^{1,†}, Jingsi Chen ¹, Jiafu Li ^{1,*} and Baiyang Chen ^{2,*}

¹ School of Public Health, MOE Key Laboratory of Geriatric Diseases and Immunology, Suzhou Medical College, Soochow University, Suzhou 215123, China

² State Key Laboratory of Urban Water Resource and Environment, Shenzhen Key Laboratory of Organic Pollution Prevention and Control, Harbin Institute of Technology, Shenzhen 518055, China

* Correspondence: jiafuli@suda.edu.cn or 1060828907@qq.com (J.L.); chen.baiyang@hit.edu.cn (B.C.); Tel.: +86-136-2213-0552 (J.L.)

† These authors contributed equally to this work.

How To Cite: Qiu, T.; Du, Z.; Chen, J.; et al. Re-Examining Cyanuric Acid: An Overlooked Non-Halogenated Cyclic Disinfection Byproduct in Swimming Pool Water. *Glob. Environ. Sci.* **2025**, *1*(2), 116–127. <https://doi.org/10.53941/ges.2025.100010>

Text S1. Method of turbidity test.

The turbidity of the water samples was measured using a scattering method based on a formaldehyde hydrazine standard solution. First, 100 mL hydrazine sulfate solution (concentration: 10 g/L) and 100 mL hexamethylenetetramine solution (concentration: 10 g/L) were prepared. Subsequently, 5 mL hydrazine sulfate solution and 5 mL hexamethylenetetramine solution were mixed and left at 25 °C ± 3 °C for 24 h. After that, a 400 NTU standard solution was diluted to 100 mL using mill-Q water. Finally, the turbidimeter (PTH090, Palintest, UK) was calibrated using 40 NTU standard

solution (diluted from 400 NTU standard solution). The turbidity in the water samples was measured using the turbidimeter. The detection limit was 0.01 NTU.

Text S2. Method of pH, urea concentration, and free residual chlorine concentration test.

SPH-006CN water quality analyzer (Palintest, UK) was used to determine the pH, urea concentration, and free residual chlorine concentration of water samples. Added the test reagent PM 130, PM 197, and PM 013 respectively to the water sample and read the data after the sample was completely colored. The detection limits were 6.5, 0.02 mg/L and 0.01 mg/L, respectively.

Table S1. Turbidity, pH, urea concentration and free residual chlorine concentration in 20 swimming pools.

Swimming Pools	Turbidity (NTU)	pH	Urea Concentration (mg/L)	Free residual Chlorine Concentration (mg/L)
Pool 1	0.28	7.69	3.5	0.4
Pool 2	0.53	7.9	7.9	0.3
Pool 3	0.34	7.63	0.2	0.4
Pool 4	0.11	7.56	7.5	0.5
Pool 5	0.33	7.4	1.4	0.4
Pool 6	0.30	7.64	5.9	0.2
Pool 7	0.10	7.77	4.8	0.3
Pool 8	0.14	7.46	3.8	0.3
Pool 9	0.12	7.76	6.9	0.4
Pool 10	0.22	7.57	2.7	0.8
Pool 11	0.26	7.80	6.8	0.2
Pool 12	0.26	7.42	1.9	0.6
Pool 13	0.18	7.46	8.7	0.2
Pool 14	0.08	7.97	10.8	0.2
Pool 15	0.32	7.24	7.4	0.4
Pool 16	0.13	7.14	2.7	0.3
Pool 17	0.75	7.36	5.9	0.4
Pool 18	0.24	7.84	11.5	0.4
Pool 19	0.23	7.79	13.3	0.4
Pool 20	0.10	7.85	7.9	0.4