water

MDPI

Supplementary materials

Comparison of Disinfection By-Product Formation and Distribution during Breakpoint Chlorination and Chlorine-Based Disinfection in Drinking Water

Dávid Stefán [1,2], Judit Balogh [3], Gyula Záray [1,4] and Márta Vargha [2,*]

Table S1. Main operational differences between chlorination technologies used for disinfection and breakpoint chlorination.

	Breakpoint chlorination	Disinfection
Contact time	minutes	hours to days
Temperature	constant	variable (seasonally)
Cl_2 dosage	~ 1.0–5.0 mg Cl_2/L	~ 0.3–1.0 mg Cl_2/L
Br^- to Cl_2 ratio	relatively low	relatively high
Possible removal of DBPs	GAC or BAC adsorption/biodegradation	biodegradation on the distribution system

Table S2. Technology parameters of GAC adsorption at the investigated waterworks.

Waterwork	Reactor volume (m^3)	Surface of sorbent (m^2)	Water production (m^3/h)	Filtration velocity (m/h)	Contact time (min)
A	2.0	1.8	21	11.7	5.7
B	1.5	1.2	12	10.5	7.5
C	0.4	0.28	3.6	12.9	6.7

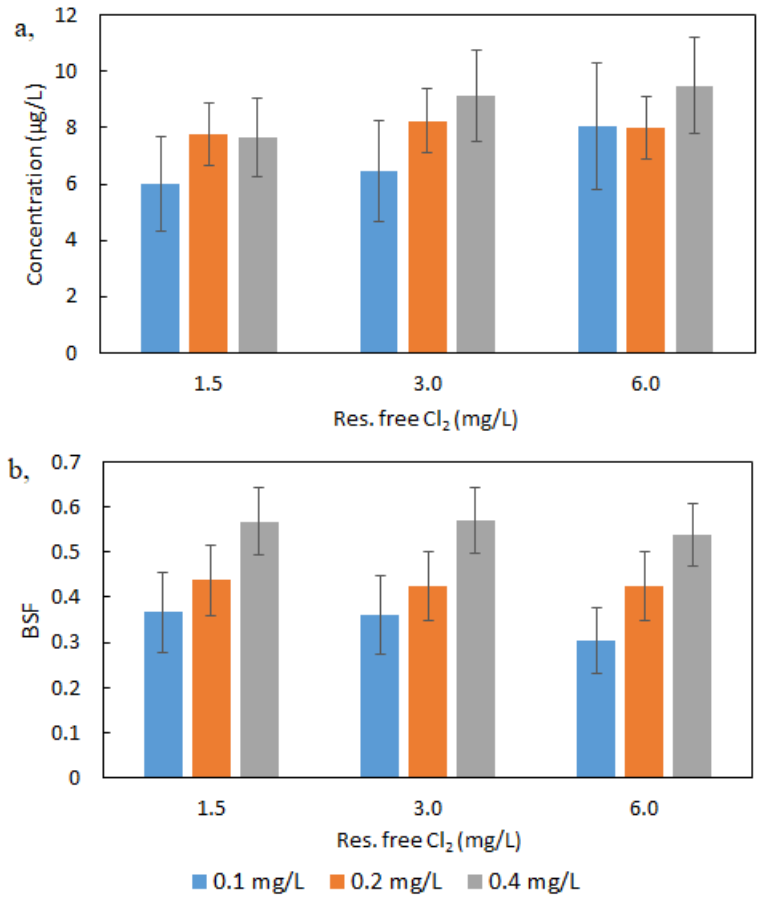


Figure S1. The effect of raw water Br^- and res. free Cl_2 on the (**a**) concentration and (**b**) distribution of DHAAs during BC.

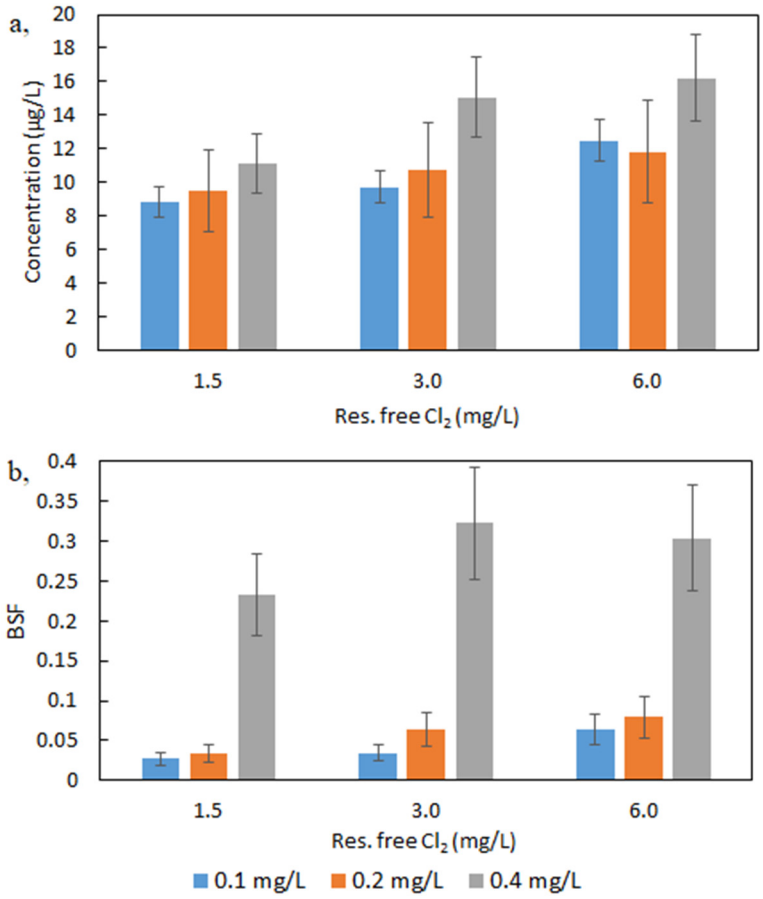


Figure S2. The effect of raw water Br^- and res. free Cl_2 on the (**a**) concentration and (**b**) distribution of THAAs during BC.

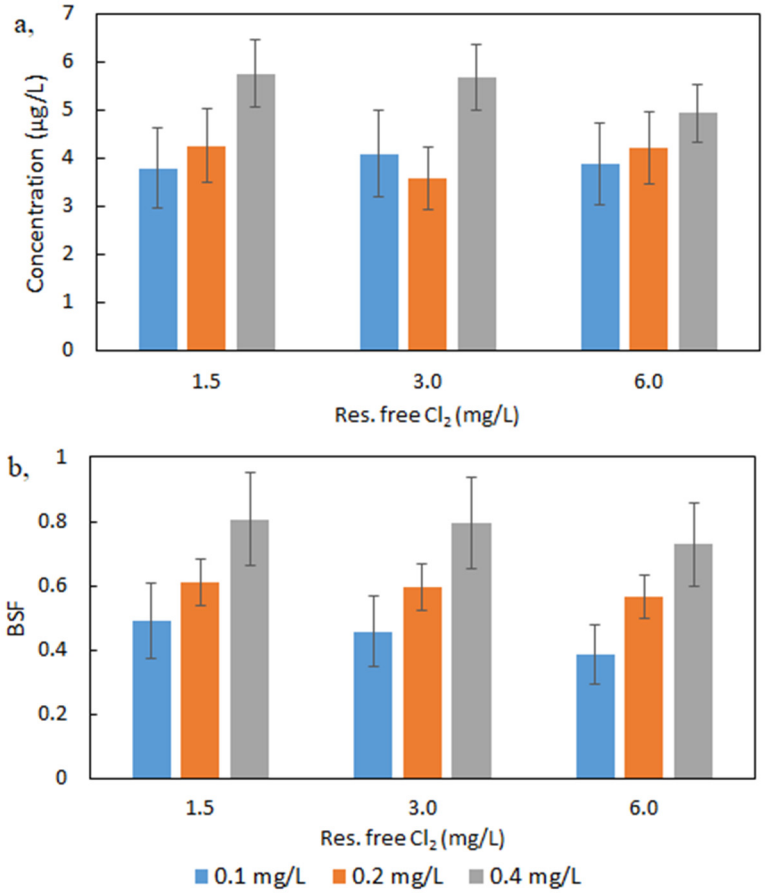


Figure S3. The effect of raw water Br^- and res. free Cl_2 on the (**a**) concentration and (**b**) distribution of DHANs during BC.

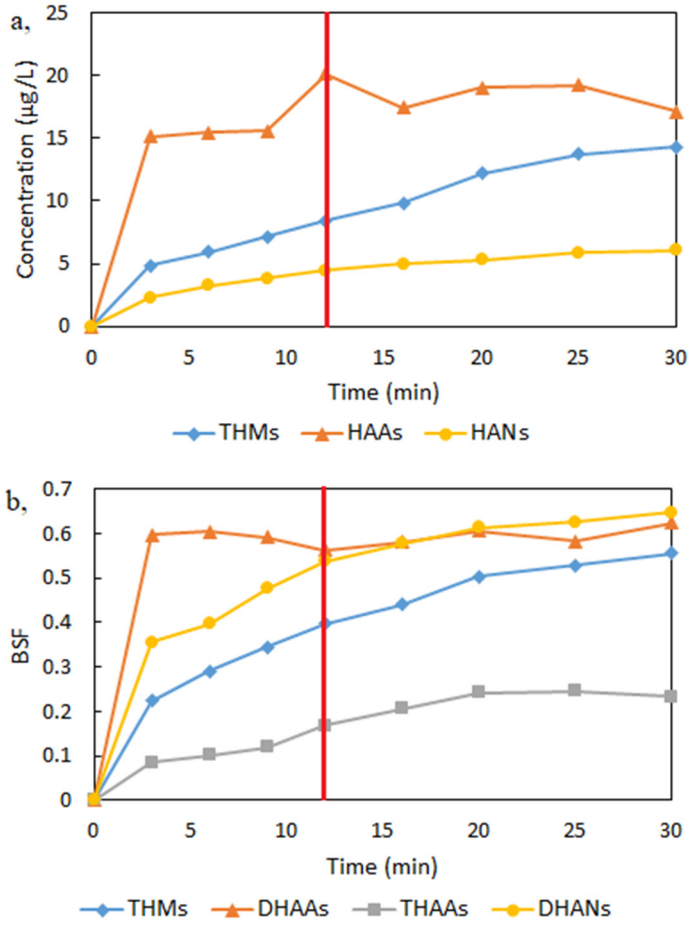


Figure S4. The (**a**) concentration and (**b**) distribution of DBPs in time during bench scale BC experiments (red line indicates the estimated time when breakpoint reaction is complete).

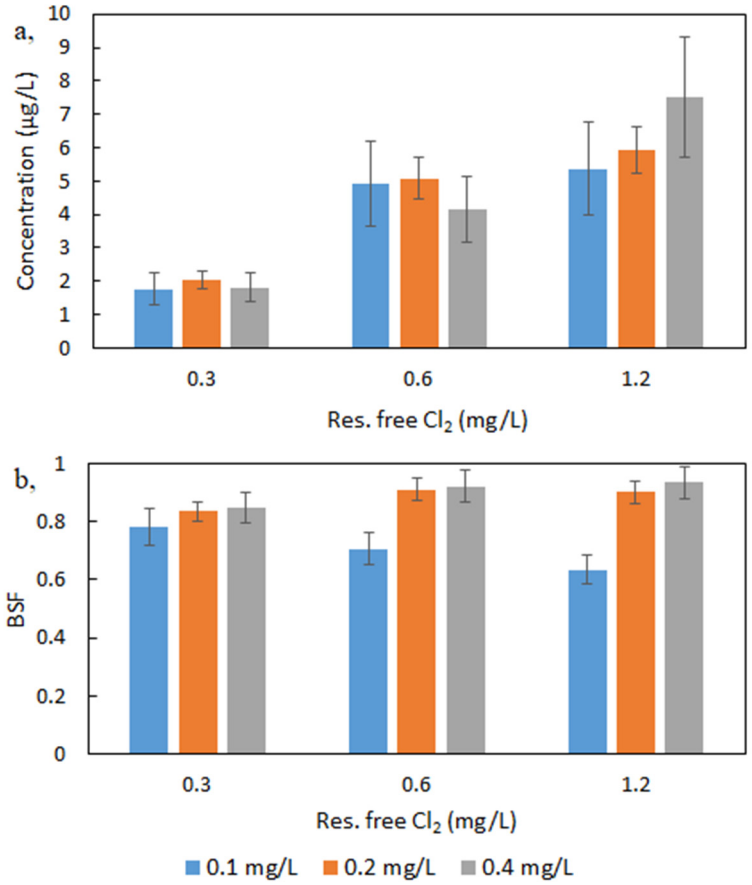
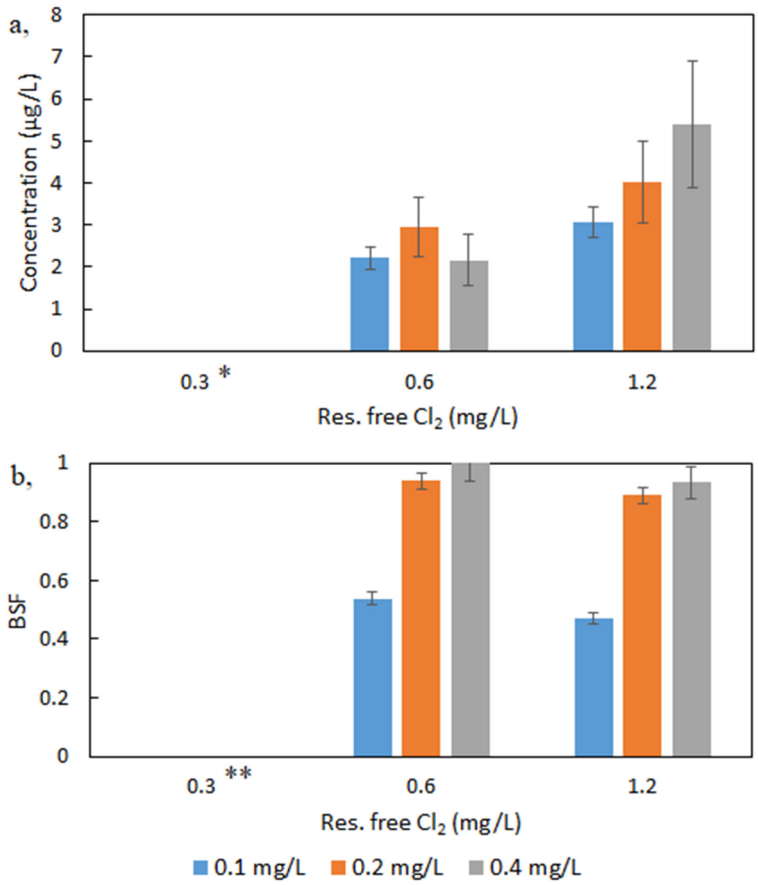


Figure S5. The effect of raw water Br^- and residual free Cl_2 on the (**a**) concentration and (**b**) distribution of DHAAs at bench scale disinfection experiments.



*: concentrations are under LOQ

**: BSF cannot be calculated because of the concentrations are under LOQ

Figure S6. The effect of raw water Br^- and residual free Cl_2 on the (**a**) concentration and (**b**) distribution of THAAs at bench scale disinfection experiments.

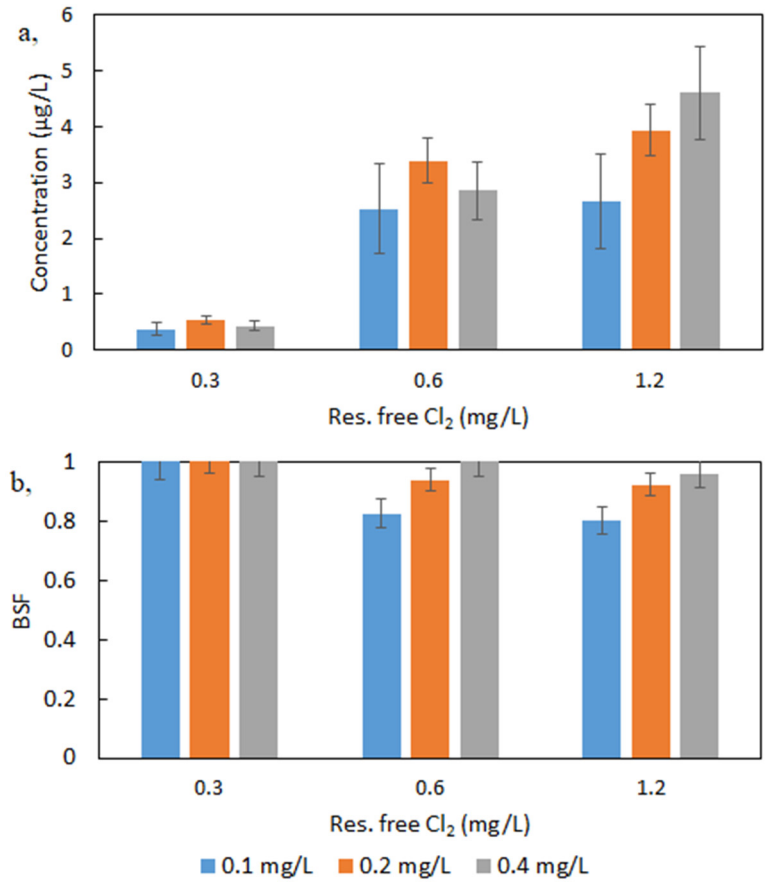


Figure S7. The effect of raw water Br^- and residual free Cl_2 on the (**a**) concentration and (**b**) distribution of DHANs at bench scale disinfection experiments.