

Ozone disinfection Study

Final report

Date: November 2020

Authors: Amaeze NJ¹, Richardson KJ¹, Jackson AL¹, Henriquez FL¹, Mackay WG¹

1. Disinfection testing unit,
School of Health and Life Sciences,
University of the West of Scotland,
Paisley PA1 2BE.

Study

“We assessed the performance of ozonated water for the inactivation of a murine hepatitis virus (MHV) as a surrogate for SARS-CoV-2.” “MHV is a coronavirus and therefore the results reported here for its inactivation can be generalised to the human coronaviruses including SARS-CoV-2.”

“MHV cannot be cultivated in tissue culture to a high titre. This limits the levels of disinfection efficacy that can be reported. All of the tests undertaken with MHV in the current study were undertaken with the highest concentrations of virus that we could achieve.” “During June 2020 a series of validation experiments were undertaken using the EORG device to generate an ozone containing water disinfectant.”

Initial efficiency test

“*E. coli* NCTC 9001 was used as the challenge.” “Under the conditions of the standard laboratory test using *Escherichia coli* as the target organism, ozonated water showed a greater than 4 Log reduction in the absence of soiling.”

MHV in a solution

“Ozonated water was effective in the inactivation of MHV under the test condition.” “The concentration of virus particles in the control (not exposed to ozone) was 2.35 Log TCID₅₀/mL. The concentration of virus particles in the test (exposed to ozone) was 0 (<0.10 Log TCID₅₀/mL). The resultant log reduction in virus titre was >2.25 Log TCID₅₀/mL.”

MHV on a plastic surface

“Ozonated water was effective when applied directly to surfaces (immersed) for inactivation of MHV under the conditions of the tests.” “The numbers of virus particles in controls 1 and 2 (not exposed to ozone) were 0.88 and 1.88 Log TCID₅₀ respectively. The numbers of virus particles in tests 1 and 2 (exposed to ozone) were both 0 (<0 Log virus particle). The resultant log reduction in virus titre were 1 and 2 logs respectively.”