

4<sup>th</sup> International Conference on **Pollution Control & Sustainable Environment**  
&  
6<sup>th</sup> Edition of International Conference on **Water Pollution & Sewage Management**  
July 26-27, 2018 Rome, Italy

---

**Household low temperature MS2 (ATCC15597-B1) virus and *E.coli* (ATCC 15597-B1) inactivation using a hot bubble column evaporator (HBCE)**

**A Garrido and R M Pashley**

University of New South Wales, Australia

The MS2 (ATCC15597-B1) virus and *E. coli* (ATCC 15597) were used as a surrogate to estimate the inactivation rates for enteric viruses and bacteria when using a hot bubble column evaporator (HBCE) system in the treatment of household wastewater. In this study, we have combined the use of 6 different gases (CO<sub>2</sub>, N<sub>2</sub>, O<sub>2</sub>, Ar, air and combustion gas) with thermal inactivation rates, using an improved double layer plaque assay technique, in order to assess the efficiency of the HBCE process for virus and bacterial removal in water. When bubbling a continuous flow of dry air at 200°C, it only heats the aqueous solution in the bubble column to about 50°C. Virus and bacteria are not inactivated by this solution temperature, as confirmed separately from water bath heating experiments. Hence, the efficiency of the HBCE process for virus and bacteria removal in water appeared to be caused entirely by collisions between the hot air bubbles and the organisms. This new energy efficient treatment for water reuse applications can reduce the thermal energy requirement to only 25% (about 113.7 kJ/L) of that required for boiling (about 450 kJ/L).

Adrian.GarridoSanchis@student.adfa.edu.au