



Is adsorption an artifact in experimentation with Triclosan?

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ABSTRACT

This paper examines the effect of adsorption of Triclosan (TCS) onto labware on the results obtained during lab-scale experiments. Three sets of experiments were considered; two of them expose the problem in water or wastewater treatability studies and the other one in microbial susceptibility testings. In the former two sets, lab-scale systems; ozonation; and membrane filtration (NF/RO) that are commonly used in water or wastewater treatability studies were utilized and the distribution of TCS within the systems were followed. The ozonation labware tested was composed of a Pyrex reactor with plastic and glass tubings. The NF/RO system was composed of a stainless steel feed tank, a stainless steel membrane unit, stainless steel flanges, and stainless steel and plastic tubings. Ozonation system was operated without ozone gas, but air. Similarly, NF/RO system was without membrane in it. Both of the systems were rinsed with methanol before experiments to remove any possible earlier contamination. During the experiments, samples were taken at certain intervals and the change in TCS concentration in water was monitored. Results obtained with lab-scale ozonation system revealed that TCS adsorbed by the surface of plastic tubing is about 100 times greater than that of glass tubing. In NF/RO system, the higher the initial TCS concentration the higher the mass of TCS adsorbed by the membrane filtration system alone was evident. In the third set, microbial susceptibility testing was conducted on *Staphylococcus aureus* for TCS and the possible effect of adsorption of TCS onto the plastic labware was sought by comparing MIC and MBC values performed by serial dilutions in aqueous and methanol solutions. MIC and MBC values determined using TCS in methanol range from 0.06 to 16 mg/L, while the ones determined with TCS in water range from 0.25 to 128 mg/L. All the results obtained indicated that adsorption is a substantial phenomenon; in the event that it is not considered, obtained results might not reflect the truth. TCS was found to adsorb seriously on plastic but not on glass labwares. Therefore, before an experimental system that will employ TCS is designed, it is essential to consider the possible adsorption onto the experimental system components and to demonstrate that there is no adsorption of TCS onto labware.

Keywords: Triclosan; Adsorption; Labware

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