

Title: SANITIZERS ASSESSMENT IN THE INACTIVATION OF *PSEUDOMONAS AERUGINOSA* ADHERED TO STAINLESS STEEL COUPONS SMOOTH AND ROUGH.

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Summary

Biofilms account for over 90% of existing contaminants in aqueous, environmental, industrial and health systems. Sodium hypochlorite is still the most widely used sanitizer, however, currently it is known of its ineffectiveness against some microorganisms and their implications in the formation of carcinogenic byproducts. The objective was to assess the effectiveness of ozone (O₃), ultrasound (US), sodium dichloroisocyanurate (DCIS) and sodium hypochlorite (HNa) to inactivate *Pseudomonas aeruginosa* adhered to smooth and rough stainless steel coupons. For bacterial adhesion were used in the AISI 304 stainless steel coupons (75x25x2mm) and *P. aeruginosa* ATCC 27853 strain in the logarithmic growth phase. They set up two tanks for the experiment, one for smooth coupons and one for the rough. In each vessel were put 30 on coupons and they were added 1,0L Tryptone Soy Broth and 1,0 mL suspension of *P. aeruginosa* (0,5 tube compatible with turbidity of McFarland scale). The tanks were maintained in BOD at 20°C for 96h. After biofilm formation, the coupons were divided into five groups (control and 04 to 01 treatments). The control group was only immersed in distilled water. Treatments DCIS (100mg.L⁻¹), O₃ (5ppm), US (37kHz) and HNa (100mg.L⁻¹) were conducted in an aqueous medium for 15 minutes. Then, there were the microbiological assays for the quantification of *P. aeruginosa* in the control and treated groups, verifying that the adhesion of microorganism was 3,35x10⁷UFC for smooth and 2,33x10⁷UFC coupons for the rough. The most effective treatments for plain coupons were respectively HNa and DCIS, with five cycles log reductions (100.0% efficiency) and four cycles log (99.99%). The ultrasound and ozone reduced three log cycles (99.91% and 99.90%, respectively). For rough coupons the most effective treatments were also HNa and DCIS, which had four cycles log reductions (99.99%) and three cycles log (99.63%), respectively. Ozone reduced cycle only one log (93.0%) and ultrasound has not reached a log cycle reduction (57.08%). There is the more difficult the action of sanitizers tested on rough coupons. HNa and DCIS were the most effective sanitizers for reducing artificial contamination with *P. aeruginosa*. They demonstrated a high potential for application on smooth and rough surfaces of stainless steel.

Keywords: Biofilms. Sanitizers. Stainless steel.

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