

20th Global Summit on

Food Processing, Safety & Technology

November 06-08, 2017 | Las Vegas, USA

Release rate and microbial inactivation effect of a slow-released ClO₂ gas gel-pack

Kyung Haeng Lee¹, Hong-Gil Kim⁴, Kyung-Hun Min⁴, Cheorun Jo² and Ki Chang Nam³¹Korea National University of Transportation, South Korea²Seoul National University, South Korea³Sunchon National University, South Korea⁴SEJIN E&P, Korea

Even though chlorine dioxide (ClO₂) is utilized in a pre-treatment due to its effective sterilizing activity for microorganisms and safety for food, it has a limitation in maintaining freshness of the food product. In this study, a low-concentration ClO₂ was produced in a packaging form of air-permeable gel pack so that it could be released continuously for 12 days. During the distribution period for 12 days, the amount of ClO₂ gas emission during distribution and microbial inactivation effect against foodborne pathogens, fungi and airborne bacteria were investigated. The amount of released gas from 5 ppm-volume gel-pack was 3.24 ppm in total for 8 days with the rate of 0.33~0.53 ppm/day. When 7 ppm-volume gel-pack was used, the amount of released gas reached 5.05 ppm with 0.43~0.91 ppm/day. When the volume of the gel-pack increased to 10 ppm, the released ClO₂ was 9.06 ppm after 8 days. The slow-released ClO₂ gel-pack showed clear inactivation effect against *Escherichia coli* and *Staphylococcus aureus* with 99.9% inactivation efficiency. Fungi including *Aspergillus niger* and *Penicillium pinophilum* were not found after storage for 12 days. There was inactivation effect in airborne bacteria with a concentration dependent manner. Therefore, the slow-released ClO₂ gel-pack is feasible to apply for industry.

Biography

Kyung Haeng Lee is currently a Professor of Food Science and Nutrition at Korea National University of Transportation, Jeungpyeong, South Korea. He is a Food Scientist and his research interest is food storage using non-thermal sterilization processing. He is also an expert of non-thermal processing for improving safety and functionality of food materials.

leekh@ut.ac.kr

Notes: