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Kinetics and Mechanism of Bacterial Disinfection by Chlorine Dioxide¹

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Abstract

Survival data are presented for a fecal strain of *Escherichia coli* exposed to three concentrations of chlorine dioxide at four temperatures. Chick's first-order reaction equation is generalized to a pseudo n th-order model. Nonlinear least squares curve-fitting of the survival data to the n th order model was performed on an analogue computer. The data were observed to follow fractional order kinetics with respect to survival concentration, with an apparent activation energy of 12,000 cal/mole. Initial experiments support the thesis that the mechanism of chlorine dioxide kill occurs via disruption of protein synthesis.

Full text

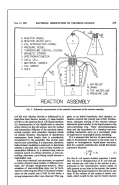
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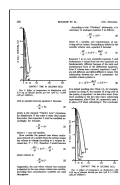
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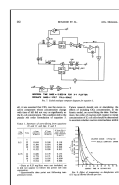
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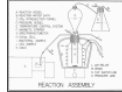
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Selected References

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- Benarde MA, Israel BM, Olivieri VP, Granstrom ML. Efficiency of chlorine dioxide as a bactericide. *Appl Microbiol.* 1965 Sep;**13**(5):776–780. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
- BRINGMANN G. Elektronenmikroskopische Befunde zur Wirkung von Chlor, Brom, Jod, Kupfer, Silber und Wasserstoff-superoxyd auf E. coli. *Z Hyg Infektionskr.* 1953;**138**(2):155–166. [[PubMed](#)] [[Google Scholar](#)]
- Knox WE, Stumpf PK, Green DE, Auerbach VH. The Inhibition of Sulfhydryl Enzymes as the Basis of the Bactericidal Action of Chlorine. *J Bacteriol.* 1948 Apr;**55**(4):451–458. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]