
Abstract

The effects of hardness and pH of water used to prepare electrolyzed oxidizing (EO) water and bleach solutions on the bactericidal activity of sanitizer prepared from the water were examined. EO water and bleach solutions were prepared with hard water of 0, 50, 100, and 200 mg/l as CaCO$_3$ at pH 5, 6, 7, and 8. Increased water hardness tended to increase free chlorine and oxidation–reduction potential (ORP) and decrease pH of EO water. Chlorine levels also increased with water pH. Water hardness and pH only had minor effect on the pH of bleach solutions. Increasing hardness to 50 mg/l increased antimicrobial effect of EO water against *Escherichia coli* O157:H7, but reduced when water hardness further increased to 100 mg/l or higher. Water pH had no effect on EO water produced against *E. coli* O157:H7. Water hardness had no significant effect on bactericidal activity of EO water against *Listeria monocytogenes* but elevated water pH decreased bactericidal activity of EO water produced against *L. monocytogenes*. Bleach solution prepared using hard water at 200 mg/l or at pH 7 or higher had significant lower efficacy in inactivating *E. coli* O157:H7, but had no effect on the inactivation of *L. monocytogenes*. Results indicate that increasing the hardness or pH of water used to prepare EO water or bleach solutions will decrease the bactericidal activity of sanitizers prepared from the water.