

Title Efficacy of sodium chlorite as an inhibitor of enzymatic browning in apple slices
Author Shengmin Lu, Yaguang Luo, Ellen Turner and Hao Feng
Citation Food Chemistry, Volume 104, Issue 2, 2007, Pages 824-829
Keywords Sodium chlorite; Browning inhibition; Fresh-cut apple; Organic acid

Abstract

Sodium chlorite (SC) is an effective sanitizer for inhibiting microbial growth. This investigation was conducted to determine the efficacy of SC as a browning control agent for use on fresh-cut apple slices, applied alone, or in conjunction with organic acids. Additionally, the authors compared the efficacy of SC to that of acidified sodium chlorite (ASC) and to several other salts and examined the effect of pH and several different organic acids on efficacy of SC. The fresh-cut apple slices were dipped in treatment solutions for 1 min, then drained and placed in plastic containers at 20 °C for 24 h, and finally stored in polyethylene bags at 5 °C for 2 weeks. Color was measured periodically during storage. Lightness (L) values for all treated and control samples measured at 4 h, 24 h, and 2 weeks of storage were compared to L value for untreated samples measured immediately after cutting. Percent decrease in L -values was calculated for each sample at each time interval. Apple slices treated in ASC or SC solution had a significantly smaller decrease in L value indicating less browning than those treated in citric acid or water control at 4 h ($P < 0.01$), and with the exception of 1 g L⁻¹ ASC and 0.1 g L⁻¹ SC, all other ASC and SC treated slices still had significantly less browning than those for the water control ($P < 0.01$) at 24 h. After 2 weeks of storage, only SC (0.5–1.0 g L⁻¹), sodium bisulfite (0.5 g L⁻¹) and calcium l-ascorbate (10 g L⁻¹) continued to inhibit browning. Treatment with 0.5 g L⁻¹ SC and pH adjusted in the range from 3.9 to 6.2 using citric acid (CA) reduced browning more effectively than 0.5 g L⁻¹ SC without pH adjustment. Two organic acids, salicylic acid and cinnamic acid, when added to SC solution, were found to achieve even better inhibition of browning than CA at the same pH value.