

Title Effect of chlorine dioxide (ClO₂) treatment on postharvest quality of grapes during storage
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Abstract

This study was conducted to develop sanitizing or freshness agents using chlorine dioxide (ClO₂) gas to minimize microbial contamination of fresh produce. After exposing grapes to 20ppm or 40ppm chlorine dioxide for 10 min in a closed container, grapes treated with 20ppm ClO₂ were packaged in Ny/PE/L-LDPE pouches, while grapes treated with 40ppm ClO₂ were placed in an empty corrugated box with sachet containing ClO₂ gas held by silica gel. The free volume of the sachet material allowed the release of ClO₂ into the headspace of packages containing the fresh grapes. Control fruit, not exposed to ClO₂, was placed in a box and stored at 0°C or 25°C. Weight loss of fruit in Ny/PE/L-LDPE film treated with 20ppm ClO₂ barely changed. Fruit treated with 20ppm ClO₂ had a lower soluble solid content than control fruit, and the 40ppm ClO₂ treated fruit at 0°C or 25°C. There was no significant differences in pH or acidity of grapes during storage period. But at 0°C 20ppm and 40ppm ClO₂ treated fruit in the film package had a lower pH value than control fruit. Anthocyanin content in grapes decreased rapidly over 3 weeks at 25°C. However, anthocyanin content in the grapes at 0°C showed no significant change for 10 weeks. Fruit treated with ClO₂ gas had less of a mottled appearance at 0°C and 25°C (author – less mottled than what other treatment? Please clarify). Fruit treated with 20ppm ClO₂ had less mold growth than fruit treated with 40ppm ClO₂. A large inhibitory effect on mold growth occurred in ClO₂ gas treated grapes at 25°C. This result may be attributed to a higher rate of diffusion of ClO₂ gas at 25°C, compared to fruit at 0°C and in the control. For comparing gas treatment, Overall grapes treated with 20ppm ClO₂ had less weight loss, mold growth, and better overall appearance than fruit treated with 40ppm ClO₂ this may be due to a delay in the growth of mold in clean packaged film, compared to fruit placed in a box after sterilizing the surface of grapes.