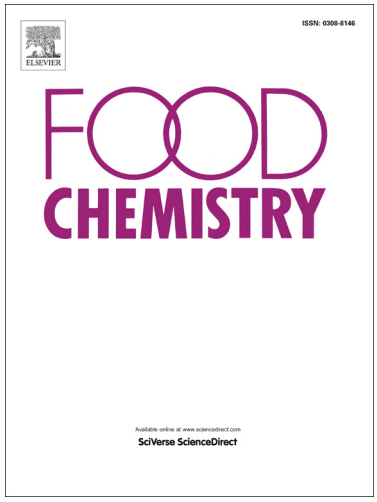

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Evaluation of non-thermal effects of electricity on ascorbic acid and carotenoid degradation in acerola pulp during ohmic heating

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Abstract

The effect of electric field on ascorbic acid and carotenoid degradation in acerola pulp during ohmic heating was evaluated. Ascorbic acid kinetic degradation was evaluated at 80, 85, 90 and 95°C during 60 minutes of thermal treatment by ohmic and conventional heating. Carotenoid degradation was evaluated at 90 and 95°C after 50 minutes of treatment. The different temperatures evaluated showed the same effect on degradation rates. To investigate the influence of oxygen concentration on the degradation process, ohmic heating was also carried out under rich and poor oxygen modified atmospheres at 90°C. Ascorbic acid and carotenoid degradation was higher under a rich oxygen atmosphere, indicating that oxygen is the limiting reagent of the degradation reaction. Ascorbic acid and carotenoid degradation was similar for both heating technologies, demonstrating that the presence of the oscillating electric field did not influence the mechanisms and rates of reactions associated with the degradation process.

Keywords: ohmic heating; ascorbic acid; carotenoid; acerola pulp.

1. Introduction

Acerola is a fruit rich in antioxidant compounds, such as vitamins, carotenoids and polyphenols. Acerola is found in South and Central America with some of the largest plantings in Brazil due to its good adaptation to soil and climate. It is well known as a rich source of vitamin C but, recently, much attention has been paid to the carotenoid content due to their antioxidant properties (Hanamura, Uchida, & Aoki, 2008; T. Mezadri, Villaño, Fernández-Pachón, García-Parrilla, & Troncoso, 2008). In Brazil, this fruit has a great economic importance, as it is both consumed *in natura* and