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Effect of High Pressure Carbon Dioxide on tomato juice: inactivation kinetics of pectin methylesterase and polygalacturonase and determination of other quality parameters

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1 **Effect of High Pressure Carbon Dioxide on tomato juice: inactivation kinetics of**
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3 **parameters**

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8
9 **Abstract**

10 Tomato juice, *Lycopersicon esculentum* cv. Canario, has been treated by HPCD as non-thermal
11 preservation treatment. The inactivation kinetics for pectinmethylesterase (PME) and
12 polygalacturonase (PG) were determined at different pressures (8.5 to 20 MPa) and temperatures
13 (35 to 55 °C). At the highest operating pressure and temperature essayed in this work, it was found
14 that PME could be almost completely inactivated, whereas PG resulted to be more HPCD resistant
15 at the working conditions. PME enzyme inactivation curves were properly described by a Weibull
16 type model, while the fractional conversion model was the most appropriate for the PG with a
17 sharp initial decrease in activity. On the contrary, high hydrostatic pressure led to a nearly complete
18 inactivation of PG while PME was very resistant at 600 MPa. It was also found that HPCD
19 treatment led to a smaller particle size distribution of tomato juice.

20 *Keywords:* Tomato juice, HPCD, enzyme inactivation, properties, HPP.

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