

## Freezing Characteristics and Texture Variation of Apple Fruits after Dehydrofreezing Assisted by Instant Controlled Pressure Drop Treatment

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**Abstract :** The present study deals with the dehydrofreezing assisted by instant controlled pressure drop (DIC) treatment of apple fruits. Samples previously dehydrated until different water contents (200, 100, and 30% dry basis (db)) and DIC treated were frozen at two different freezing velocities (V+ and V-), depending on the thermal resistance established between the freezing airflow and the sample surface. The effects of sample water content (W) and freezing velocity (V) on freezing curves and characteristics, exudate water (EW) and texture variation were examined. Lower sample water content implied higher freezing rates, lower initial freezing points (IFP), lower practical freezing time (PFT), and lower specific freezing time (SFT). EW (expressed in g exudate water/100 g water in the product) of 200% and 100% db apple samples was approximately 3%, at low freezing velocity (V-). Whereas, it was lower than 0.5% for apple samples with 30% db water content. Moreover, the impact of freezing velocity on EW was significant and very important only for high water content samples. For samples whose water content was lower than 100% db, firmness (maximum puncture force) was as higher as the water content was lower, without any insignificant impact of freezing velocity.

**Keywords :** dehydrofreezing, instant controlled pressure drop DIC, freezing time, texture

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