Study of vacuum evaporation by using ohmic heating

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ABSTRACT

Vacuum evaporation is one of the most popular processing methods for juice concentration; however, non-uniform termal treatment cause the processing time longer, which means quality loss. In this project ohmic heating was applied in vacuum evaporation, critical operation variables such as material temperature, vacuum pressure, concentration ratio was studied, and juice concentrates from different procedures were compared by both quality determination and sensory evaluation. The results showed that if vacuum chamber was kept at 25mmHg, materials were boiled at room temperature; current and conductivity were found very low, which indicated ohmic heating was not appropriate here. However, if the vacuum chamber was kept at 30 or 50mmHg, the material temperature could reach at 30 or 35°C, respectively. This range seems to be appropriate for ohmic heating. Electrical conductivity was found increased during the process, due to the increasing electrolyses. This result indicated that the thermal effect increased during evaporation, which was totally different than traditional process. In comparison study, concentrated products by ohmic heating were found better than tradition process, which meaned there contained protential for this new process.

Keywords : ohmic heating ; vacuum evaporation ; juice

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