

Electrodialysis in whey desalting process

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ABSTRACT

The utilization of whey is limited by its high content of salts. We used electrodialysis unit ED-Z mini (Mega a.s., Stráž pod Ralskem, Czech Republic) to remove ions from sweet whey and whey with added salt (1% w/w of NaCl) and observed conductivity changes during the process. Samples were taken every 10 min and the drop in K^+ , Na^+ , Ca^{2+} , Mg^{2+} was measured by capillary electrophoresis PrinCE-C 750 (Prince Technologies B.V., Emmen, The Netherlands). Ions were detected with the DAD detector at 206 nm and the quantity was determined according to calibration. The negative detection with imidazole in the basic electrolyte was used. Normal whey was desalted in 50 min from the conductivity of 4.83 mS/cm to 0.32 mS/cm. Concentration of Na^+ decreased from 0.43 g/L to 0.02 g/L, Ca^{2+} from 0.45 g/L to 0.07 g/L. Salted whey was demineralized in 65 min from 18.41 mS/cm to 0.34 mS/cm. The Na^+ concentration decreased from 3.92 g/L to 0.08 g/L, Ca^{2+} from 0.33 g/L to 0.03 g/L. These results demonstrate that electrodialysis is an effective way of elimination of salts from whey.

Keywords: Electrodialysis; Demineralization; Whey; Ion removal; Salts

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