

Recovery of valuable, heat sensitive products and concentrates by Eutectic Freeze Crystallization

Background

Eutectic freeze crystallization (EFC) is a newly developed crystallization technique that operates at subzero temperatures. The eutectic point of an aqueous solution is the concentration and temperature where both the solvent (ice) and the solute (e.g. salt/sugar) starts to crystallize simultaneously. Due to the density difference between the solvent and solute, separation by gravity is possible. A pure stream of ice and solute can then be extracted, the remaining liquid can be separated further or recycled again into the process. In comparison with other separation technologies like evaporation, EFC has a low energy requirement and has the ability of complete conversion of feed in to water and solidified solutes. This research focusses on the recovery of heat sensitive products and concentrates in the agro and food industry by eutectic freeze crystallization.

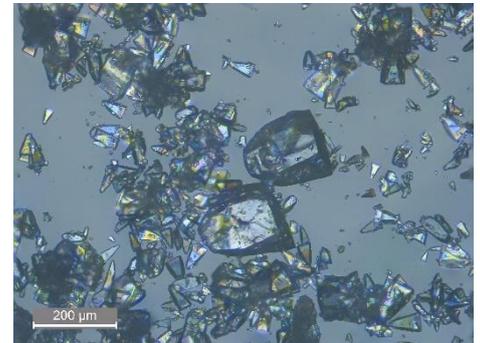


Figure 1 Lactose crystals produced by low temperature crystallization

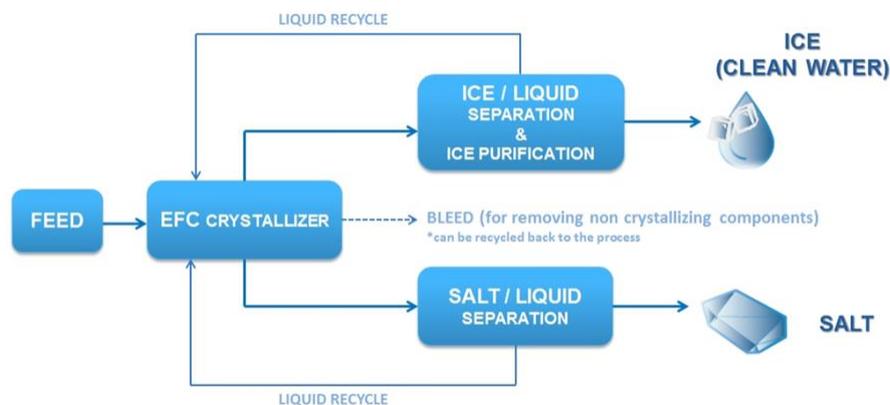


Figure 2 Eutectic freeze crystallization proces diagram

Tasks

- Literature study on EFC and crystallization
- Focus on lactose crystallization in batch and/or continuous systems
- Operating the setup with different solutions and operating conditions
- Analysis of particles by microscopy and analytical techniques.

Our Offer

- Working at the laboratory, in Leeuwarden, and develop your lab skills
- The opportunity to work in an international organization
- A monthly allowance for living expenses of 350 euro per month.

Who can apply?

We are looking for a Bsc. or Msc. student in the direction of food processing, process or chemical engineering. You have preferably some experience in a chemical laboratory. Furthermore, you are able to write and speak English fluently and you are able to work independently.



Figure 3 EFC setup at the laboratory of Wetsus

Starting date: September 2019. If you are interested in the project please send a cv and motivation letter to ruben.halfwerk@wetsus.nl If you have any questions you can contact me by email or by tel. 0031 (0) 642874300