

POSTER ABSTRACT

**ECONOMIC ASSESSMENT AND TECHNICAL CHALLENGES
OF IMPLEMENTING THE STEFFEN PROCESS TO DESUGARISE
CANE SUGAR STREAMS**

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Abstract

A substantial amount of sucrose is not available for recovery by crystallisation in various streams in the sugarcane processing industry, such as raw house molasses. The implementation of cost effective sucrose recovery methods to these streams can add significant economic benefits to the sugarcane industry. Precipitation of saccharated lime (also known as the Steffen process) used to be a widely practised method to desugarise sugarbeet molasses before the introduction of chromatographic separation. Under the correct conditions, adding lime to molasses can cause precipitation of saccharated lime. The saccharated lime is then recycled to the main process clarification or carbonatation stage, wherein calcium is removed as calcium phosphate or calcium carbonate and sucrose is released to the aqueous solution. In cane sugar processing, however, the major drawback of calcium sucrose precipitation has been the presence of high concentrations of non-sucrose components in the sugarcane molasses which are recovered with sucrose. A few studies have investigated the parameters that influence calcium sucrose precipitation and have tried to circumvent the precipitation of non-sucrose components from sugarcane molasses with no successful commercial application. The objectives of this study were to highlight the concept behind the Steffen process and to carry out an economic analysis of the Steffen process in the local cane sugar industry. The achievable recoveries at the lab scale of about 30% were below the required economically viable recoveries of about 74%. Items which need to be addressed if the Steffen process is to be considered as a potential desugarising method are highlighted.

Keywords: saccharated lime, precipitation, molasses, Steffen process, lime, recovery