

A Solution to Sugar Industry by Potential Use of UF Ceramic Membrane for Clarification of Sugarcane Juice and Concentration of Juice by FO Membrane

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One of the revenue earning industry in majority of country is sugar. The Sugarcane (*Saccharum officinarum*) juice is the prime raw material for the sugar industry. The conventional method for production of sugar involves crushing of cane fibers and extraction of raw juice, clarification using lime and flocculants, sulphitation, evaporation and crystallization. This study includes clarification of sugarcane juice using LaPO_4 coated UF ceramic membrane and concentration of clarified juice by FO with low energy consumption. The feed solution is introduced to shell side of the membrane at flow rate of 40 L/h, pressure 125 psi and temperature 35 °C. The Physiochemical characteristics of sugarcane juice of feed and permeate like particle size distribution, brix, turbidity, sucrose content, pH, colour and purity are analyzed. It can be concluded that particle above 70 nm are removed by the membrane filtration. A bacteria removal study is also done here. We have addressed the issue of sucrose loss (sucrose degradation) by clarifying the juice with membrane technology. UF clarified has 2.7% sucrose loss and raw juice without pretreatment has 43.52% after 6 h at room temperature. The cake formation is the dominant factor for the decrease of flux. Clarified juice is concentrated with aquaporin membrane at feed flow rate 25Lh-1 and draw flow rate 45Lh-1 in counter current mode of operation. The clarified juice is used as feed in shell side and draw solution (NaCl) is circulated through tube side of membrane module. After 12 min the concentration of sucrose, fructose and glucose is 52.19% increase from initial concentration. The reverse solute flux decreased. No sugar component is found in draw solution conformed by HPLC analysis of draw solution.

Biography

Aanisha Akhtar is currently a PhD scholar in the Indian Institute of Technology, Guwahati (India). She has worked as senior research fellow in the Chemical Engineering Department of Indian Institute of Technology in the topic of development of microbial fuel cell. She has obtained her Bachelor of Technology degree in Chemical Engineering (2008) from Dr. M.G R University (Tamilnadu) and M Tech in Petroleum Exploration and Production Engineering (2012) from Dibrugarh University (Assam). She has worked as guest lecturer in Assam Engineering College (Jalukbari) (2009). In the Assam Engineering Institute and Baksha Polytechnic she has worked as guest lecturer after finishing her M tech degree. In the year 2015 she has joined PhD in the Indian Institute of Technology, Guwahati. She has a very strong research interest in the field of membrane science and technology for water, food applications. She has received a bester poster presentation in international conference "Recycle" for kitchen waste management. She has a published article in the topic of domestic source of municipal solid waste (MSW) in Guwahati city, India: Quantification and characterization. In the BPI 2018 international conference (Delhi IIT) received one of the best poster presentation awards. She has received many awards and scholarship in the school days and secured 2nd position in the state level and got government added scholarship in the school days. Currently another article in membrane separation process is in under review in the journal of Separation and Purification Technology.