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## Separation of lactose from lactulose syrup: Statistical perspective

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Lactulose is a synthetic disaccharide which is produced by the isomerization reaction of lactose in an alkaline environment. Nowadays, the beneficial properties of lactulose in pharmaceutical and nutrition industry have attracted the attention to explore various perspectives of this disaccharide. Therapeutic effects of lactulose on Portal Systemic Encephalopathy (PSE) and chronic constipation diseases show the importance of lactulose in the pharmaceutical industry. The main challenge associated with lactulose synthesis is a considerable amount of unreacted lactose in the reaction media. So far, various methods have been suggested to separation of lactose as an impurity from the lactulose syrup. In this study effect of ethanol and operating temperature in theseparation process of lactose from lactulose syrup was statistically investigated. Taguchi model was utilized to address the importance and effectiveness of the involved factors as well as statistical optimum condition. For this purpose, proportion of ethanol: syrup and operating temperature wereselected as the effective factors. Ethanol: Syrup ratio contains six levels which are 0:2, 2:2, 3:2, 4:2 ,5:2 and 6:2 and operating temperature levels consist of three levels of 25°C (room temperature), 31°C, and 37°C. Based on the Taguchi model response, Ethanol concentration has the higher the effect than operating temperature on separation of lactose from syrup. Also, Taguchi model revealed that the optimum separation point is at the highest operating temperature and highest ethanol, concentration, however, engineering considerations suggest optimum operating area between 31-37°C for operating temperature and 4:2 to 6:2 for ethanol: syrup ratio for.

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