

KEY WORD : HIGH FRUCTOSE SYRUP/TAPIOCA STARCH/FLUIDIZED BED

NUTTAPONG BOVORNREANGROJ : PRODUCTION OF HIGH FRUCTOSE SYRUP FROM
TAPIOCA STARCH IN FLUIDIZED BED. THESIS ADVISOR : PROF. SOMSAK
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Hydrolysis tapioca starch via Termamyl 1.2 g (per 1,000 g DS.)

pH 6.0-6.5 at 105°C for 2 hrs. yielded a maximum reducing sugar of 78.55 mg/ml with a DE. of approximately 20. A subsequent hydrolysis in shake flask as well as batchwise fluidized bed reactor using AMG 1.5 ml (per 1,000 g DS.) pH 4.0-4.5 at 60°C for 48 hrs. yielded maximum reducing sugar of 372.52 and 371.69 mg/ml respectively with a DE. of approximately 93. While using AMG 1.3 ml and Promozyme 0.6 g (per 1,000 g DS.) yielded maximum reducing sugar of 386.30 and 391.88 mg/ml consecutively with a DE. in the range of 96-98.

High fructose Syrup (HFS) was achieved in packed bed and fluidized bed reactors with the optimized conditions of glucose solution from saccharification liquefied tapioca starch 45 % (w/w), magnesium sulphate 0.2 % (w/v) and sodium metabisulphite 0.04 % (w/v). In packed bed reactor using Sweetzyme T. 16 g (dry. wt.) with addition of substrate at the feed rate of 0.3 ml/min. Whereas, in the fluidized bed reactor using Sweetzyme T. 125 g (dry. wt.) with addition of substrate at the feed rate of 60-120 ml/hr and aeration rate 1.5-2.0 L/min were performed. The pH of both processes were controlled at 7.5-8.0 with the operating temperature was 60°C. Interestingly in both reactors under these conditions showed the production of 42-45 % high fructose syrup. Moreover, after chemical examination by the method of UDC 664. 162. 79 food additive and contamination were found under accepted limitation.