果糖结晶工艺的优化 Optimization on the Crystallization of Fructose

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摘 要： 针对国内结晶果糖生产中存在的问题，对果糖结晶工艺进行改进，并优化工艺参数。研究发现，向高果糖浆中加入表面活性剂Span 60，可使结晶果糖的变异系数降低51.5%，提高果糖晶体均匀性；在进行结晶前，用高效糖化酶降解低聚糖，可将果糖浆粘度降低26.2%。酶解最佳工艺条件为：酶解时间20h，强效糖化酶用量为600mg/kg，pH值4.0，酶解温度55℃。优化的果糖结晶工艺条件为：晶种添加量为2%，初始过饱和度为1.02～1.08，添加乙醇前的降温速率为0..4℃/h；乙醇添加量为0.2，Span 60用量为100mg/kg。添加乙醇后降温速率：52～46℃为0.28℃/h，46～43℃为0.55℃/h，43～35℃为0.80℃/h，35～25℃为0.90℃/h。在优化条件下，最终提糖率为56.92%，结晶果糖平均粒径为221.9μm。 The improvement of the crystalline technique of fructose was reported. The effect of sucrose ester S-570 and surfactant Span 60 on crystals was studied, and the results show that the CV of crystals can be reduced by 51.5% when adding 100mg/kg Span 60. The optimal glucoamylase is utilized to hydrolyze oligosaccharides in fructose syrup, under the optimal conditions: enzymes/oligosaccharides 600mg/kg and hydrolysis time 20h, pH value 4.0, reaction temperature 55℃, fructose syrup concentration 60%. The optimized cooling-crystallization conditions are as follows, seeds amount 2%, initial supersaturation degree 1.02～1.08, cooling rate before adding ethanol 0.4℃/h, ethanol concentration 0.2, cooling rate after adding ethanol: 0.28℃/h (52～46℃), 0.55℃/h (46～43℃), 0.80℃/h (43～35℃), 0.90℃/h (35～25℃). With the optimized parameters, the final product yield is 56.92%, and the mean size is 221.9μm.

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