

高压CO₂-水混合体系水解菊粉制备果糖工艺High Pressure CO₂-Water System for Inulin Hydrolysis to Produce Fructose

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关键词: 菊粉 高压CO₂-水混合体系 水解 果糖

摘要: 为了解决利用传统酸水解菊粉制备果糖工艺的缺点,采用高压CO₂-水混合体系代替普通酸性水溶液,研究了菊粉在该体系中的水解情况,考察了CO₂压力、反应温度和反应时间对菊粉水解制备果糖的影响。结果表明,菊粉的水解度随CO₂压力的增大、反应时间的延长而增大,随反应温度的升高先增大而后下降。在反应压力为20MPa、反应温度为70℃、反应时间为3h的条件下,菊粉的水解度达94.9%,说明菊粉在高压CO₂-水溶液混合体系中水解可实现高效率生产果糖,避免了传统酸水解工艺复杂和污染的问题。With the aim to solve the drawback on the traditional fructose production from inulin hydrolysis in acidic aqueous solution, the high pressure CO₂-water system for the inulin hydrolysis was studied instead of the traditional acidic aqueous solution. The effects of CO₂ pressure, reaction temperature and reaction time on fructose production from inulin hydrolysis were investigated. The results showed that the hydrolysis degree of inulin was positively related with CO₂ pressure and reaction time, and increased at first followed by decreasing with reaction temperature rise. Under an optimum reaction condition of CO₂ pressure 20MPa, reaction temperature 70℃ and reaction time 3h, the hydrolysis degree of inulin reached 94.9%, which implies that the inulin is efficiently hydrolyzed to produce fructose in the high pressure CO₂-water system, and the complicated operations and pollution of the traditional acid hydrolysis process were avoided.

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