The simultineous enzymatic hydrolysis of tapioca starch for instant formation of glucose

Abstract

This study investigated the possibility of simultaneous reactions of the gelatinization, liquefaction and sacchrification (SGLS) carried out at two reaction temperatures of saccharification 55 and 60°C for instant glucose production as well as controlling low viscosity of solute over the hydrolysis period. At 55°C, 10% (w/w) of the tapioca starch and 0.9 mL L-1 of a blending mixture of α-amylase and amyloglocosidase, the viscosity was kept low below 2.2×10-3 pa-s throughout the hydrolysis process. The conversion of the tapioca starch to glucose was as high as 65% (w/w) over 28 h of the hydrolysis time. Increasing the temperature to 60°C did not increase the conversion but, (1) increased the maximum rate of reaction from 8.89g L-1 h-1 to 13.3 g L-1h-1(2) reduced the time to reach a half of the final glucose concentration from 6.1 to 5 h and also (3) slightly increased the earlier stage of solute viscosity without affecting the entire process.