Enzymatic hydrolysis of xylan extracted of sugarcane bagasse for the production of Xylooligosaccharides

Brienzo, M., Milagres, A.M.F.

Escola de Engenharia de Lorena, Dept de Biotecnologia – USP, Brazil

Sugarcane bagasse xylan was isolated in a one-step chemical pretreatment using hydrogen peroxide in an alkaline media yielding mainly xylose (80.9%) with small amount of glucose and arabinose. Xylan was prepared in water and xylanase derived from *Thermoascus aurantiacus* was added to the suspension. For hydrolysis analysis, a factorial design complete 2^2 was proposed, using as variables substrate concentration (0.5 – 3.5%) and enzymatic activity (40 – 80 UI/g). The reaction was carried out for 3 to 96 hours at 50° C. The maximum conversion (41.6 ± 0,45 %) was obtained with 2.6 % (w/v) of substrate and 60 U/g xylanase activity in raw extract, which allowed verify the second order model validity obtained for this hydrolysis. The sugar composition of xylooligosaccharide per solid content of the thus obtained saccharified product was analyzed by high-performance liquid chromatography (HPLC). The results showed that the xylooligosaccharide consisted of 6 mg/ml of xylose and 8 mg/ml of xylobiose which corresponded to 39% of xylose, 59% of xylobiose, and 2% of other XOS. After the completion of the reaction, powder active carbon was added to the reaction product, and the mixture was decolorized. Then, the active carbon having sugar adsorbed thereon was removed by a filter press and washed with 15% and 30% ethanol to collect sugar from the active carbon. Then, the collected sugar was eluted in a bio gel P2 filtration column to obtain a xylobiose and xylose.

Key words: xylooligosaccharides; xylanase; *Thermoascus aurantiacus*; sugarcane bagasse; xylan.

Supported by: FAPESP and CNPq