

Profile of enzymes relevant to solvent production during direct fermentation of sago starch by *C. saccharobutylicum* at different pH control strategies.

ABSTRACT

The profile of enzymes relevant to solvent production during direct fermentation of sago starch by *Clostridium saccharobutylicum* P262 in a 2 L stirred tank fermenter was determined utilizing different pH control strategies. During fermentation without pH control (initial pH of 6), the specific activity of crotonase, thiolase, and β -hydroxybutyryl-CoA dehydrogenase increased proportionally with solvent production. The highest crotonase (3,450.7 kat) and phosphotransbutyrylase activity (1,475.6 kat) was observed in fermentation where pH was maintained at 5 during the acidogenic phase and corresponded to a fairly high acid accumulation but low solvent production. During fermentation with a controlled pH of 5.25 during the solventogenic phase, the highest thiolase specific activity (255.7 kat) was obtained and corresponded to the highest production of acetone. On the other hand, the highest specific activities of crotonase, β -hydroxybutyryl-CoA dehydrogenase, and phosphotransbutyrylase were observed at pH 5.5 and corresponded to the highest production of ethanol and butanol. Butyryl-CoA dehydrogenase had no significance role in solvent fermentation. These results suggested that pH control strategies were important for improvement of solvent production during direct fermentation of sago starch by *C. saccharobutylicum*. © KSBB

Keyword: Sago starch; *Clostridium saccharobutylicum*; Solventogenesis; Acetogenesis; Enzymes relevant to solvent fermentation.