Production of bioethanol and associated by-products from potato starch residue stream by Saccharomyces cerevisiae

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Abstract:

Potato starch residue stream produced during chips manufacturing was used as an economical source for biomass and bioethanol production by Saccharomyces cerevisiae. Results demonstrated that 1% H2SO4 at 100 ºC for 1 h was enough to hydrolyze all starch contained in the residue stream. Two strains of S. cerevisiae (y-1646 and commercial one) were able to utilize and ferment the acid-treated residue stream under both aerobic and semi-anaerobic conditions. The maximum yield of ethanol (5.52 g L⁻¹) was achieved at 35 ºC by S. cerevisiae y-1646 after 36 h when ZnCl2 (0.4 g L⁻¹) was added. Addition of NH4NO3 as a source of nitrogen did not significantly affect either growth or ethanol production by S. cerevisiae y-1646. Some secondary by-products including alcohol derivatives and medical active compound were found to be associated with the ethanol production process.

Keywords:

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