Abstract

Production, viscosity, and chemical composition of xanthan synthesized by bacterium Xanthomonas campestris pv pruni strain 101 were evaluated in bioreactor systems. During the process, the volumetric oxygen mass transfer coefficient (kLa) and the biomass were determined and the pH was monitored. The cultures were grown in a 3 l bioreactor, with aeration and agitation varying as follows: conditions (A) 300 rpm, 3 vvm and (B) 200 rpm, 2 vvm, at 28 °C. Our results showed that gum production was dependent on kLa, with a maximum yield of 8.15 g/l at 300 rpm, 3 vvm, 54 h of fermentation, kLa 21.4/h, while biomass was not affected. All aqueous solutions of 3% (w/v) xanthans synthesized showed a pseudoplastic behavior. The highest viscosity was reached under the strongest aeration/agitation conditions. All xanthan samples contained glucose, mannose, rhamnose, and glucuronic acid as their main components. The highest agitation and aeration rates used under condition A (300 rpm and 3 vvm) favorably influenced the yield and viscosity of the xanthan produced by bacterium X. campestris pv pruni 101 at different fermentation times.

Keywords

Xanthomonas campestris pv pruni, xanthan gum, aeration/agitation