Determination of kinetic parameters for biodegradation of PVA by *Microbacterium barkeri* LC and *Paenibacillus* sp. LC

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Abstract

The purpose of this study is to determine the biodegradation kinetics of PVA by *Microbacterium barkeri* LC and *Paenibacillus* sp. LC. Biodegradation of PVA was tested by using a pure culture of these 2 species of microbes. The effect of different concentrations of PVA on the rate of bacterial biodegradation was investigated. The Monod equation was used in this study for estimation of kinetic parameters, and the kinetic constants obtained were μm=0.213 $h^{-1}$and Ks=5.4 mg/L for *Microbacterium barkeri* LC, and μm=0.207 $h^{-1}$and Ks=5.6 mg/L for *Paenibacillus* sp. LC, respectively.

References

1. Nord F. F., Dehydrogenation activity of Fusarium lini B(1936), *Naturwiss* **24**, 763.
2. Abdel-Hamid M. I., Ahmed G. A.-W, Hassan R. M. (2002), Kinetics and mechanism of oxidation of poly(vinyl alcohol) macromolecule by chromic acid in aqueous perchloric acid(2002), *Eur. J. Polym.* **37**, 2201-2206.
3. Kawai F, Yamanaka H. (1986), Biodegradation of polyethylene glycol by symbiotic mixed culture (obligate mutualism), *Arch Microbiol* **146**, 125-129.
4. Chiellim E., Corti A, Solaro R (1999), Biodegradation of poly(vinyl alcohol) based blown films under different environmental conditions, *Polymer Degradation and Stability* **64**, 305-312.
5. Hatanaka T, Hashimoto T, Kawahara T, Takami M, Asahi N, Wada R. (1996), Biodegradability of oxidized poly(vinyl alcohol), *Biosci. Biotechnol. Biochem.* **60**, 1861-1863.
6. J. H. Finley (1961), Spectrophotometric determination of polyvinyl alcohol in paper coatings, *Analytical chemistry* **33**, 1925～1927.