

Physical and stability characteristics of Burkholderia cepacia lipase encapsulated in κ -carrageenan

Abstract

In this work, a novel approach for lipase immobilization was exploited. Lipase from *Burkholderia cepacia* was encapsulated into κ -carrageenan by co-extrusion method to form a liquid core capsule. The diameter of the encapsulated lipase was found to be in the range of 1.3-1.8 mm with an average membrane thickness of 200 μm and 5% coefficient of variance. The encapsulation efficiency was 42.6% and 97% moisture content respectively. The encapsulated lipase was stable between pH 6 and 9 and temperature until 50 °C. The encapsulated lipase was stable until disintegration of the carrier when stored at 27 °C and retained 72.3% of its original activity after 6 cycles of hydrolysis of p-NPP. The encapsulated lipase was stable in various organic solvents including methanol, ethanol, iso-propanol, n-hexane and n-heptane. Kinetic parameters K_m and V_{max} were found to be 0.22 mM and 0.06 $\mu\text{mol}/\text{min}$ for free lipase and 0.25 mM and 0.05 $\mu\text{mol}/\text{min}$ for encapsulated lipase respectively. © 2008 Elsevier B.V. All rights reserved.