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Lipase and soy protein adsorption by silica nanoparticles to preparation cross-linked enzyme aggregates for hydrolysis soybean phospholipids

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Abstract In order to improve the hydrolysis performance of cross-linked enzyme aggregates and the defects of the smaller particles affecting the reuse, the lipase added soybean protein, silica nanoparticles as adsorption carrier preparation lipase cross-linked aggregates were studied. The prepared cross-linked enzyme aggregates showed lipase activity recovery of 94.34 f 0.81 %, and particle size reached about 1100 nm, which is favorable

for reuse. The thermal stability is significantly improved, the half-life of lipase activity at 65 degrees C is 5.2 times of free lipase. The lipase cross-linked aggregates were applied to hydrolyze soybean phospholipids in two-phase system consisting of n-hexane and water for 8 h, Hydrolysis rate of 125.1 f 1.2 % and hydrolysis speed of 2.57 f 0.05 g/h, which was 3.5 times of free lipase. This study provides a technical basis for new stratagem of preparation cross-linked enzyme aggregates with silica nanoparticles as carrier and soybean protein as cross-linking additive, and application of lipase for hydrolysis of soybean phospholipids.

Keywords

Author Keywords: Lipase; Soybean protein; Silica nanoparticles; Cross-linked enzyme aggregates; Soybean phospholipids

Keywords Plus: MAGNETIC NANOPARTICLES; A(1)-CATALYZED HYDROLYSIS; IMMOBILIZED LIPASE; BETA-GALACTOSIDASE; CLEAS; PHOSPHATIDYLCHOLINE; STABILITY; SUPPORT; REUSABILITY; LINKING

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