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Capillary electrophoresis-integrated immobilized enzyme microreactor utilizing single-step in-situ penicillinase-mediated alginate hydrogelation: Application for enzyme assays of penicillinase

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Abstract

Rapid, low-cost and efficient assays for penicillinase activity and inhibition are of vital importance for therapeutics and diagnostics of bacterial resistance to antibiotics. Herein we report a novel approach for on-line enzyme assays for penicillinase utilizing capillary electrophoresis-integrated immobilized enzyme reactors (CE-IMERs). The CE-IMERs are fabricated based on penicillinase-mediated alginate hydrogelation, allowing single-step in-situ encapsulation of enzymes without any additional manipulation process. We show that the fabricated CE-IMERs have high enzyme loading capacity with approximately 61.8% of the original penicillinase in the

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