Optimized Conditions for Recovery and Reuse of Immobilized Lysosomal Enzymes as an Antimicrobial Agents

방승혁, 김소정, 김 필, 김양훈[1], 민지호*
전북대학교; [1]충북대학교
(jihomin@jbnu.ac.kr*)

As a tool for the stable enzyme reuse, enzyme immobilization skill has been investigated for several decades. Surface of magnetite nanoparticles coated with (3-aminopropyl) triethoxysilane (APTES) by a silanization reaction have been enhanced as a support for the immobilization of enzyme in this study. To immobilize the lysosomal enzymes , we examined through rotation method at room temperature for 2 hours optimized in this study, the immobilization efficiency, activity and recovery of lysosomal enzymes immobilized on magnetite to form amine group nanoparticles were evaluated. Among various volume ratio (w/w) of lysosomal enzymes and TiO2 nanoparticles, we found that 100 % of immobilization efficiency of was observed at a ratio of 1:5, 10 and 20 (enzymes:magnetite; w/w). Furthermore, the antimicrobial activities of the immobilized lysosomal enzymes were confirmed using viable cell counting methods against Escherichia coli. Immobilized lysosomal enzymes could be recovered by magnetic separation and showed the constant activity during recycles.