

Nickel Ferrite (NiFe_2O_4) Nanoparticle Clusters for the Efficient Recyclable Separation of Histidine-Tagged Proteins

최진녕, 서상우, 정규열, 이진우*
포항공과대학교
(jinwoo03@postech.ac.kr*)

Affinity separation based on a specific interaction between a metal ion and histidine-tagged (His-tagged) protein is one of the most efficient methods for purifying recombinant proteins. In order to devise a simpler and more efficient method for the recyclable separation of His-tagged protein, nickel ferrite (NiFe_2O_4) nanoparticle clusters (NPCs) were synthesized by a simple hydrothermal method and employed in this work. The structure of NiFe_2O_4 NPCs provides a large surface area ($105.0 \text{ m}^2 \text{ g}^{-1}$) and pore volume ($0.32 \text{ cm}^3 \text{ g}^{-1}$), which are preferable for the separation of large amounts of proteins. The high magnetic saturation value (41.3 emu g^{-1}) and superparamagnetic property of these materials lead to a more efficient magnetically recyclable separation of His-tagged proteins. We confirmed that the binding capacity and selective separation ability seen in the first separation were strongly maintained for up to 7 cycles.