

Characterization of metal ion – poly(2-acetamido acrylic acid) hydrogel as a purification system for His-tagged recombinant protein

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We developed a novel protein purification system using metal ion-complexed poly(2-acetamido acrylic acid) (PAAA) hydrogel and characterized the system using recombinant green fluorescence protein tagged with hexahistidine on its N-terminus (His6-GFP) as a target protein. His6-GFP was expressed using pET expression system and cell lysate containing the recombinant GFP was utilized to test the purification system. We confirmed that the His-tagged protein from the crude cell extracts was selectively bound to the Ni ion-complexed PAAA hydrogel using sodium dodecyl sulfate polyacrylamide gel (SDS-PAGE), confocal laser scanning microscopy (CLSM), photoluminescence(PL). We compared the efficiency of the developed purification system with the commercial Ni²⁺-NTA agarose gels. Cobalt ion-complexed PAAA hydrogel was compared to the nickel ion system.

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