

Dispersed magnetic silica nanoparticles with immobilized metal affinity ligands for his-tagged enzyme adsorption

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Silica-coated magnetite(Fe_3O_4) nanoparticles with immobilized metal affinity ligands were prepared for histidine-tagged enzyme adsorption.

magnetite nanoparticles were synthesized by co-precipitating Fe^{2+} and Fe^{3+} in an ammonia solution. Then silica was coated on the Fe_3O_4 nanoparticles using a sol-gel method to obtain magnetite silica nanoparticles. The condensation product of 3-Glycidoxypropyltrimethoxysilane (GLYMO) and iminodiacetic acid (IDA) was immobilized on them and after charged with Cu^{2+} , the magnetic silica nanoparticles with immobilizes were applied for the adsorption of histidine-tagged lipase. TEM showed that the magnetic silica nanoparticles with an average size of 70nm were well dispersed image. X-ray diffraction showed the spinel structure for the magnetic particles coated with silica. the stability of the free and the immobilized histidine-tagged lipase was studied under various conditions.