

## **NANOHYBRID CORE-SHELL MAGNETIC MATERIALS FOR BIOMEDICAL APPLICATION**

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### **Abstract**

Gold-coated magnetic nanoparticles are a class of nanoparticles that have attracted much attention because of their advantageous characteristics, such as their inertness, non-toxicity, super magnetism, ease of detection in the human body, a magnetic core that is protected against oxidation, their facilitated bio-conjugating ability, catalytic surface, and their potential for a variety of biological applications. Gold-coated nanoparticles have great biocompatibility with the human body with the ability to interact with biomolecules such as polypeptides, DNA, and polysaccharides. Herein we report a synthetic procedure for the preparation of water-soluble Fe<sub>3</sub>O<sub>4</sub>@Au core-shell nanoparticles, simple protocol for their purification by exclusion chromatography and method for functionalization of gold surface with a number of sulfur-containing ligands. We describe a distinct effect of non-heating superlow-frequency magnetic fields on the kinetics of chemical reactions catalyzed by the enzymes -chymotrypsin (ChT) immobilized on core-shell nanoparticles.

**Keywords:** Core-shell magnetic nanoparticles, biomedical application

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