

## **Abstract**

Nanomagnetic particles play an important role in the field of bio-separations and biomedical applications. Due to their size, nanoparticles provide large area for adsorption of solutes by magnetic field. The objectives of this research were to synthesize magnetite nanoparticles ( $\text{Fe}_3\text{O}_4$ ) and determining its efficiency in phenylalanine extraction from aqueous solutions. In this study two different methods were used to synthesize magnetite nanoparticles ( $\text{Fe}_3\text{O}_4$ ). The first is typical coprecipitation method by  $\text{Fe}^{+2}$  and  $\text{Fe}^{+3}$  salts in alkaline medium and the latter is a microemulsion method which the effect of a new surfactant upon adsorption rate of phenylalanine on nanomagnetic particles ( $\text{Fe}_3\text{O}_4$ ) has been studied. Consequently, the effect of pH, contact time and concentration of phenylalanine were investigated in a batch system. Transmission electron microscopy (TEM), XRD and FTIR were used to characterization of the synthesized magnetite nanoparticles.

**Keywords:** Extraction, Phenylalanine, Magnetite nanoparticles ( $\text{Fe}_3\text{O}_4$ ), Batch system.



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**Solid phase extraction of phenylalanine  
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from water samples**

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