

# Chapter 14

## Smart Surface with Ferromagnetic Properties for Eco- and Bioanalytics



M. Pajewska-Szmyt, R. Gadzała-Kopciuch, A. Sidorenko,  
and Bogusław Buszewski

**Abstract** This chapter provides a brief overview of the literature about the use of magnetic particles. Particularly for eco- and bioanalytics as a sorbents to sample preparation, which can be applied to wide variety of target compounds from complex organic matrices. There are many ways to synthesize magnetic nanoparticles e.g. co-precipitation, sol-gel, microemulsion or sonochemical reactions. It is very important to stabilize these particles by immobilization of the layer on the magnetic core. Furthermore, it is possible to performed a lot of modification e.g. attached of functional groups onto the surface or imprinting the compound molecule. This made the magnetic nanoparticle as a selective and specific tool for analytical applications. This materials have a lot of advantages such as simple synthesis and possibility of reusing, however it is also some disadvantages e.g. necessity to synthesize monodisperse nanoparticles. Nonetheless the popularity of the magnetic materials have an increasing trend in various application.

**Keywords** Ferromagnetic materials · Magnetic nanoparticles · Magnetic molecular imprinted polymers · Sample preparation

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M. Pajewska-Szmyt · R. Gadzała-Kopciuch · B. Buszewski (✉)  
Department of Environmental Chemistry and Bioanalytics, Faculty of Chemistry, Nicolaus Copernicus University, Toruń, Poland

Interdisciplinary Centre for Modern Technologies, Nicolaus Copernicus University, Toruń, Poland

e-mail: [bbusz@chem.umk.pl](mailto:bbusz@chem.umk.pl)

A. Sidorenko

D. Ghitu Institute of Electronic Engineering and Nanotechnologies, Chisinau, Moldova

I.S. Turgenev Orel State University, Orel, Russia

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