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**MODIFICATION, CHARACTERIZATION AND
APPLICATION OF SOLID PHASE EXTRACTOR FOR
THE REMOVAL OF UNWANTED POLLUTANTS FROM
NATURAL WATER.**

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A Thesis submitted in Partial Fulfillment
Of
The Requirements for the Degree of

Master of Science

In
Analytical Chemistry

**Chemistry Department
Faculty of Science, Fayoum**

Fayoum University

2010

ABSTRACT

In this work a great trials were used for the preparation of a newly type of modified PUF that can be used for the extraction and the Preconcentration of Fe(II), Mn(II) and Cu(II) ions.

A technique used for this purpose is Solid - phase extraction (SPE). This technique designed for rapid, selective sample preparation, purification and provides the sample clean-up, recovery, and concentration necessary for accurate quantitative analysis.

From this point, polyurethane foam (PUF) functionalized by its reaction with carbon disulphide and ammonia after its hydrolysis by 6 mol/l HCl to adsorb inorganic species (heavy metal ions) from different media. The work presented in this thesis is divided into four chapters.

Chapter 1: Introduction, This chapter includes some properties of PUF as good sorbent, hazards of heavy metal ions on life specially human and animal.

Chapter 2: Review of Literature, This chapter includes some reviews about hazards of heavy metal ions especially iron, manganese, and copper studied ions during the course of this work. Some techniques used in preconcentration and/or separation of trace levels of heavy metal ions mentioned, especially SPE and its utility in analytical applications in on-line and/or off-line procedures. Furthermore, this chapter includes some information about the material under modification used in this work, importance, structure, preparation, physical and chemical properties, and its analytical application (biological and industrial applications) as a sorbent in SFE technique.

Chapter 3: Materials and Methods, This chapter involves information about instruments, chemicals, and reagents used in this work, methods of preparation of modified foams in addition to the methodology employed in this work. In addition, sample preparation and the recommended procedure explained in details within this chapter.

Chapter 4: Results and Discussion, Here, we discuss the characteristics of the achieved DTC-PUF sorbent. Then, the study of chemical parameters such as pH, shaking time, capacity, interfering ions and hydrochemical parameters such as sample flow rate are undertaken in this chapter. Finally, applications of the developed sorbent for preconcentration of tested metal ions from various real samples (Qaroun lake water, tap water, and spinach and Parsley leaves) collected from Fayoum City. Finally, the thesis demonstrates the references utilized in this work and conclusions achieved from the whole work and the recommendations for future work that may be a conducted in this area