SEPARATION OF FE(III) AND ZN(II) IONS BY SOLVENT EXTRACTION USING A NEW TRİKETONE REAGENT AND THEIR DETERMINATION BY FAAS

Şerife SACMACI¹, Şenol KARTAL¹ and Mustafa SACMACI²

¹Erciyes University, Department of Chemistry, Faculty of Arts and Sciences, TR-38039, Kayseri, Turkey
²Bozok University, Department of Chemistry, Faculty of Arts and Sciences, 66200, Yozgat (sacmaci@erciyes.edu.tr, Tel: +90 352 4374937; fax: +90 352 4374933)

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Solvent extraction processes have attracted considerable attention from the viewpoint of the analytical separation and extraction of metals in a pure state. Due to its inherent simplicity, solvent extraction is a remarkable alternative, widely used for the separation of metal ions from aqueous solutions and avoiding the undesirable features associated with the precipitation processes. In fact, solvent extraction plays an important role in hydrometallurgical industries, and thus a great effort has been continuously devoted to the development of new extractants [1].

Trikutones, like 1,3-diketones, are versatile ligands in coordination chemistry, being able to coordinate both one and two metal ions per molecule [2]. Triketones are well recognized precursors for carbocyclic and heterocyclic systems as well as tridentate ligands in coordination chemistry [3].

In this study, a simple, rapid and accurate method was developed for separation and preconcentration of trace levels of zinc and iron in environmental samples. Methyl 2-(4-methoxybenzoyl)-3-(4-methoxyphenyl)-3-oxopropanoylcarbamate (MMPC) has been proposed as a new complexing agent for Zn(II) and Fe(III) ions using solvent extraction prior to their determination by FAAS. The synthesis of the MMPC was carried out according to the procedure described by Saçmacı et al. [4]. Some analytical parameters including pH (9.0), sample volume (200 mL), shaking time (1 min), amount of MMPC reagent (10 mL of 0.1%, w/v), volume of MIBK (5+3 mL), amount of NaCl (5 mL of 1%, w/v) etc. were optimized. The recovery values for Zn(II) and Fe(III) were greater than 95% and the detection limits for zinc(II) and iron(III) ions were 0.21 and 0.24 µg L⁻¹, respectively. The preconcentration factor was found to be 200. The validation of the presented procedure was checked by the analysis of CRM. The presented procedure was applied to the determination of zinc and iron in some environmental samples.

![](attachment:image.png)

Fig 1. Chemical structure of the MMPC reagent

References