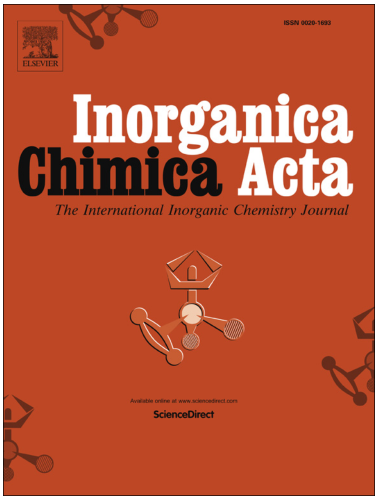

Research paper

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PII: S0020-1693(17)30883-6
DOI: http://dx.doi.org/10.1016/j.ica.2017.06.020
Reference: ICA 17668

To appear in: *Inorganica Chimica Acta*

Received Date: 6 June 2017
Accepted Date: 7 June 2017

Please cite this article as: A. Szebesczyk, E. Olshvang, J. Besserglick, E. Gumienna-Kontecka, Influence of structural elements on Iron(III) chelating properties in a new series, *Inorganica Chimica Acta* (2017), doi: http://dx.doi.org/10.1016/j.ica.2017.06.020

Influence of structural elements on Iron(III) chelating properties in a new series of amino acid-derived monohydroxamates

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Abstract

A series of amino acid-derived monohydroxamate compounds **A1** – **A7** was synthesized and characterized for their coordination properties of Fe(III). The series varies in their skeletal lengths and compositions; some compounds lack external substituents, others are substituted with external functional amino or carboxylic groups, or alternatively inert methyl. Undertaken investigations allowed the determination of stoichiometry, stability constants and spectroscopic parameters of formed ferric complexes. Incorporation of an external functional group with a dissociable proton affects the coordination behaviour; the presence of carboxylic or amino groups hampers the formation of mono-, di- and trihydroxamate ferric complexes of presented compounds. The differences in Fe(III) affinity of the monohydroxamates vs. trihydroxamates was reflected by the stability constants and pFe, indicating the superior stability of hexadentate complexes.

Keywords: Siderophores, hydroxamates, Fe(III) complexes

1. Introduction

Ferric iron is an essential element in a variety of metabolic processes, such as oxygen metabolism, electron transfer processes, and DNA and RNA synthesis [1, 2]. However, in aerobic environment it forms insoluble hydroxy-polymers inaccessible to microorganisms. Siderophores, or iron carriers, are